

THE PRACTITIONER

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Purblind Medicine.

By SIR ROBERT PHILIP, M.D., LL.D., Hon. F.R.C.S.E.

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“**A** PURBLIND Argus, all eyes and no sight.” Thus mighty Ajax, as caricatured by Alexander the serving man of Cressida. In no captious spirit it may be asked whether modern medicine with her manifold technical aids runs no chance of similar portraiture. Do not we suffer the trees to obscure the wood ? In the dazzle of details are not biological principles apt to be eclipsed ?

The line of thought is suggested by long experience of consulting work, more especially in the sphere of tuberculosis.

The other day, a young woman, aged thirty-one, was brought to me on account of glandular disease. The tuberculous character of the affection was obvious by reason of : (a) present enlargement of numerous glands, and (b) monumental remains. The patient had been subjected to operative treatment on thirty-one occasions, and each of these had left its impress. Incision after incision, *cui bono* ? To remove urgent disfigurement ? If so, well and good. But if it were proposed

thereby at the same time to eradicate the tuberculous infection, *nulli bono*. Not only no good, but the hints and guidance afforded by the glandular enlargement were missed. Nature's signpost was ignored. Face to face with clamant facts there was no sound or sufficient attempt to meet the issue until, at the present time, not only was the lymphatic system widely involved, but visceral tuberculosis was in course of development.

This is no isolated or exceptional incident, but one example of numberless occurrences met in the daily round.

Take another illustration. It is long since the tuberculous toxin was shown especially to affect neuromuscular structures. The resulting muscular dystrophy—loss of sarcous substance—is one of the marked symptoms of advancing disease. The effects are registrable in visceral, no less than in skeletal, muscles. Yet how seldom is the cardiac insufficiency of young tuberculized subjects traced to its true source! The wholesale experience of the war was needed to enforce the lesson that a large proportion of D.A.H. cases is the resultant of tuberculous intoxication.

And the so-called malnutrition of childhood, vague delicacy of youth, repeated obscure pyrexia, recurrent eye disorders, or unusual gravity of sequelæ after measles? Traced to their ultimate source, how often are such effects found referable to a tuberculized soil!

From another point of view, consider the common statement regarding cavitation in pulmonary tuberculosis. A patient with pronounced cavities in the lung is, for the most part, spoken of as in the last stage of the disease. This is a scientific misconception, pregnant with disastrous possibilities. Each academic term it is my custom to show to the members of the class of tuberculosis a series of patients in whom the classic signs of extensive cavitation were registered twenty, twenty-five, and more years previously. In some of

these the signs have continued throughout the interval; in others they have gradually lessened or disappeared, while in either event the "owners" themselves are still going strong.

Another fatal fallacy has frequently emerged. It lies in a remarkable unwillingness on the part of the doctor to admit the presence of tuberculosis in the child, and that, often enough, when the evidence is staring him in the face. This is true of many expressions of tuberculosis, but has seemed to me especially so in respect of pulmonary tuberculosis. Any diagnosis is suggested—all kinds of hybrid pneumonia, bronchitis, and even malignant disease in infants—rather than accept the likely and, in many instances, the evident fact.

Why is it that genito-urinary tuberculosis is so constantly missed until the all-too-ready aid of the surgeon is invoked? Tell-tale symptoms and signs, abundant and recurrent, are passed over, apparently as features hardly worthy of note, until the completed picture, familiar in the operation theatre or the post-mortem table, has become recognizable.

How paradoxical the attitude of many practitioners towards the pronounced case of lupus or of spondylitis with spinal symptoms, and their attitude towards the early beginnings of either of those conditions! Easy-going carelessness in presence of Nature's obvious and repeated warnings, to be succeeded by therapeutic helplessness and the transference of the patient to the care of the so-called specialist.

In tuberculous infection, more than in any other morbid process, the invasion is quiet and the advance slow. The progress is step by step. At each stage symptoms and signs are registrable by the informed observer if he takes the trouble to look and think. When unchecked, the progress is towards disaster sooner or later. The parable of the inoculated guinea-

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thereby at the same time to eradicate the tuberculous infection, *nulli bono*. Not only no good, but the hints and guidance afforded by the glandular enlargement were missed. Nature's signpost was ignored. Face to face with clamant facts there was no sound or sufficient attempt to meet the issue until, at the present time, not only was the lymphatic system widely involved, but visceral tuberculosis was in course of development.

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facts it appears foolish blundering not to scrutinize child life with care—even with a degree of suspicion—for evidence of tuberculous infection. Only thus may we hope to anticipate and prevent fateful fructification.

For, the seed having germinated, it is not easy to say what will be the harvest. As I have previously put it :

The most slender seedling of tuberculosis is potentially as significant as the full-grown tree. It is the seed lightly sown in childhood that for the most part determines the occurrence and course of tuberculosis in later life. The child who has been thus tuberculized is doubly significant because of what he is and because of what he may become. The tuberculosis of a people begins in the nursery and the schoolroom. It is to the nursery and schoolroom that observation and effort should be directed if measures for the eradication of tuberculosis are to be fundamentally sound and practically effective.¹

The recognition of this principle has been the basis of successful communal procedure against tuberculosis. The systematic examination of contacts for early manifestations of infection has meant—whenever it is efficiently carried out—the detection of tuberculosis at the seedling stage, that is, at a time when the process may be countered with expectation of satisfactory result.

One of the especial purposes of this article in *THE PRACTITIONER* is to urge the practitioner to follow a similar course in his family practice. Were the matter handled in this definite fashion throughout the country by doctors who would take the trouble to explain the *why* and the *wherefore*, the blighting influence of tuberculosis might largely be discounted.

Having regard to the possible consequences of tuberculous infection, the determination, even approximate, of the *time when* the individual is tuberculized constitutes one of the most significant facts in his life history. And the means for the determination lies ready to hand in simple tests: either the cutaneous (Pirquet) test by tuberculin, or, for young children, the percutaneous (Moro) test. The simplicity of the latter removes any feeling of fear on the part of child or parent. Both tests are innocuous, and, for the most

pig is realized in human life. If only the practitioner were instructed to think in terms of the guinea-pig!

Why is it that, even yet, two facts of immense importance and universal application remain outside the scope of the ordinary practice of medicine?

1. It has been demonstrated time after time beyond a shadow of a doubt by clinical and pathological observation that, among civilized populations, tuberculous infection occurs in the great majority of persons. If it be said that tuberculosis kills a relatively small proportion of the persons so affected, the statement is counterbalanced by the fact that mortality from tuberculosis is still high, and that it is not easy to predicate which of the persons infected will suffer the more serious consequences.

2. It has been no less clearly shown that in the great majority of instances tuberculous infection is contracted in childhood—at some point between birth and the close of the school period. This implies that there is a moment in the life of the individual child, no less than in the experimental guinea-pig, when the tubercle bacillus passes the frontier and obtains entrance into the system. From that moment onwards the possible consequences are varied and worthy of fullest consideration.

Yet, so far as my experience enables me to judge, neither of these facts enters much into the calculations of those who are in charge of the rising population. In our endeavours to create tubercle-free herds such considerations play a large part—indeed, form the basis of operations. In the infinitely more significant human problem they seem largely discounted.

Lack of knowledge of those fundamental facts was responsible for the failure to cope effectively with tuberculosis throughout 2,000 years. Now things are changed. No longer can ignorance be pleaded as apology for inaction. In face of such demonstrated

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part, the results are clearly indicative in one or other direction.

The routine method in the investigation of contacts at the Tuberculosis Department of Edinburgh University includes (1) a full clinical examination, and (2) the use of tuberculin by one or other of the above methods. By this procedure it is not uncommon to find that out of a household of half a dozen children three or four give a positive reaction, while the remainder may be negative.

When the result is negative the test is repeated after an interval, and so on again, say, every three or six months. When the result is positive there is no need for worry or fuss. The point is that the doctor knows definitely that the child is tuberculized. If the parents or guardians are intelligent it is well that they should know the fact and understand what it means.

Henceforth the child's life history is viewed in a fresh light. So long as everything goes well there is little to be done, apart from maintaining a physiological environment. On the other hand, ailments which might be otherwise obscure, or continuous delicacy, will be viewed with particular interest. The growth and development of the child will be jealously watched. In examining the child from time to time the lymphatic and neuromuscular systems will be specially scrutinized. In this fashion the first buddings of tuberculosis can hardly fail to be observed. And later, as years go on, important incidents or proposals in the life of the individual will be discussed with the fact in mind.

Alongside those two cardinal propositions regarding the occurrence of tuberculosis—namely (1), its universality, and (2), its probability in childhood—may be cited certain significant deductions which have been made from what is generally described as the *phenomenon of Koch*. Those include the view that an individual, when once infected with tuberculosis, is not liable to

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second infection, and that, for the most part, the recurrent emergence of tuberculous disease in later life—wherever it appears—is to be interpreted as an extension of the existing infection to fresh points, or a reactivation of focal disease. There is abundant support for the interpretation. The infection of tuberculosis comes thus into line with the infection of syphilis. It would not be amiss if, without undue insistence, the analogy were kept in mind in interpreting the frequently changing picture of tuberculous disease.

From these considerations the simple, but far-reaching lesson is that, under present conditions, we doctors ought to watch for the advent of tuberculous infection in the growing child very much, *mutatis mutandis* (for the analogy is, of course, not complete), as the dog-breeder looks for distemper among the young of his kennel. As already indicated, positive evidence of tuberculization is readily obtained.

Thereafter the policy of the doctor should be *anticipatory* and *preventive*. If the child's physiological resistance be maintained at a high level, and exposure to further bacillary invasion limited as far as possible, little more is likely to happen and nothing more need be done. An approach to immunity has been attained on natural lines.

Should any indication—focal or systemic—point to a breach of immunity, then is the moment to attempt more active immunization. We must seek to meet tuberculization by *detuberculization*. If tuberculin has antigenic value (and its continued use for almost forty years leaves me no doubt on the point) its efficacy is proportionate to its *timely* use.

It is my custom to begin the therapeutic use of tuberculin whenever, in the presence of a positive reaction to tuberculin, there is the slightest indication of tuberculous disease, such as minor enlargement of

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lymph nodes, muscular hypotonus, vaso-motor paresis, or more general nutritional disturbance. When thus indicated the use of tuberculin is most readily maintained in the child by the percutaneous method.²

The therapeutic results of the patient use of this procedure are striking. Glandular enlargements are progressively reduced. Other minor indications yield similarly. Malnutrition and muscular enfeeblement are replaced by progressive gain in weight. This method of *anticipatory detuberculization* has proved so satisfactory for a number of years that it has become almost routine practice among the large clientele of children who are resident or ambulant patients at the several institutions linked with the Tuberculosis Department of Edinburgh University.

The following practical deductions are worthy of thoughtful consideration :

1. The occurrence of tuberculous infection is to be expected in childhood.

2. The graver manifestations of tuberculosis in later life are ultimately dependent on this early infection.

3. The occurrence of such early infection can be determined by simple measures.

4. For every child the date of occurrence should be systematically watched for and registered.

5. If the date of initial infection has not been thus registered an endeavour should from time to time be made to determine the fact of tuberculization before clamant evidence of tuberculous disease appears.

6. Following such determination effective measures should forthwith be taken to re-enforce the resistance of the tuberculized child, with a view to anticipate and prevent subsequent development of graver manifestations.

References.

¹ *Edinburgh Medical Journal*, October, 1912.

² *British Medical Journal*, March 24, 1923.

Recent Work on Vitamins.

By R. H. A. PLIMMER, D.Sc.

Professor of Chemistry in the University of London at St. Thomas's Hospital Medical School.

MODERN work on nutrition dates from the experiments of Sir F. G. Hopkins (published 1912), who so clearly proved that life could not be maintained on a suitable mixture of protein, fat, carbohydrate and mineral salts unless certain unknown substances, which he called accessory food factors, were also present in the diet.

The American workers, Osborne and Mendel, and McCollum and Davis, shortly afterwards divided the unknown constituents of food into two groups called by the latter fat soluble A, and water soluble B, both groups of unknown being essential for life and growth of rats.

Much older observations had connected certain diseases with diet, but it was not known which constituents of the diet were concerned. Thus it was well known, but frequently forgotten, that the absence of fresh fruits and vegetables led to scurvy. Many observers had pointed out that rickets was caused by a faulty diet; and the beneficial effect of fats, especially cod-liver oil, was constantly made use of in medical practice to cure the disease. The Eastern disease, beri-beri, was shown to be caused by the absence of some essential from the food, and pellagra was found to be curable by a change in diet.

The term vitamin was given by Funk to the unknown substance which prevented beri-beri. It was found in whole seeds, especially in the germ of seeds, and was soluble in water and in dilute alcohol. It had a similar distribution to the water soluble B, and mainly for this

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reason the vitamin of Funk and water soluble B were believed to be identical. Hence came the association of the word vitamin with water soluble B. Fat soluble A became vitamin-A. To bring the unknown preventing scurvy into line it was called vitamin-C. The prevention of pellagra was believed to be connected with animal protein which contains all the known amino-acids, and was thought to be due to the absence of some amino-acid.

Fat soluble A was found to be present in certain fats and absent from others. The early work of Mellanby upon the production of rickets in puppies connected a fat soluble substance with this disease. He found that the same fats prevented rickets as those which contained fat soluble A. So fat soluble A became associated with the prevention of rickets. Recent work has shown that the fat soluble vitamin is really composed of two factors, which are called A and D. The former is preventive of the eye disease xerophthalmia, and it is the latter which is directly concerned with the calcification of the bones and teeth.

Some fats, but not cod-liver oil, which has vitamins-A and -D, appear to contain a third fat soluble substance called vitamin-E, which is necessary for reproduction in rats maintained on an artificial diet containing vitamins-A and -D.

Vitamin-B in its modern aspect also seems to be a double unknown. The two parts are named B₁ and B₂. The first, B₁, is connected with the prevention of beriberi, and is the same as the old B. The second is connected with the prevention of pellagra, and is also called the PP (pellagra preventing) factor. The two B factors are often found together in the same foods, but the association is not so constant as in the case of vitamins-A and -D.

Each of the vitamin groups is associated with different parts of the food. Vitamins-A and -D are in

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that a diet for an adult should contain 100 grams of protein, 100 grams of fat, and 500 grams of carbohydrate, and yield 3,000 calories. Smaller quantities are required for women and children. All these data are given in the textbooks of physiology.

The quantitative aspect of the vitamin side of the diet is equally important and is commonly neglected. The general idea is erroneous that if a little of a vitamin food is eaten it supplies enough of the vitamin. There is only a very little of the vitamin in any food, and plenty of that food must be eaten so as to get enough for the perfect health of the body. The absence of chemical information about vitamins and the amount of each required, as well as the amounts in the different foods, has led to doubt of their existence and criticism of their importance in the diet. The chemistry of vitamins has now opened out, and there is much more information about the amount in certain foodstuffs. Thus vitamin-D seems to be ergosterol activated by ultra-violet light, and vitamin-B₁ has apparently the formula $C_6H_{10}ON_2$. A definite, structural, chemical formula has yet to be given to ergosterol, and there is still to be found out what happens on exposing it to ultra-violet light. Further information is wanted about vitamin-B₁.

At any rate, with the knowledge that ergosterol is the basis of vitamin-D, the quantitative aspect of the amount required has been capable of determination. The figure for a baby rat is 1/10,000 milligram a day. For a child the figure is given as 2 to 4 mgm. a day. This quantity is minute in comparison with the total dry weight of the food (300 grams), and corresponds with 1 part in 10,000. The chemist's work in the future will be to analyse the various fats and other foods for ergosterol, an operation attended with great difficulty and an immense amount of labour. It is the separation of 5 or 6 parts, or even less, in 10,000. Not many are

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likely to undertake such work. Alternatively, as is being done at the present time, ergosterol is extracted from ergot or yeast, and is activated and used as a curative of rickets. Foods should still be tested for their antirachitic action, for normally it should not be necessary to resort to the administration of activated ergosterol.

VITAMIN-A AND VITAMIN-D.

The differentiation of the fat soluble vitamin-A into two separate factors was the first stage in the recent work on rickets. Mellanby never suggested that the antirachitic substance was the same factor as fat soluble A. The very similar distribution and chemical and physical properties simply led to the assumption that the two were identical. McCollum was the first to bring out a definite indication that cod-liver oil contained two vitamins. Cod-liver oil was aerated at a high temperature so as to destroy its vitamin-A, and it was found to retain its antirachitic properties, though it had lost its power of preventing xerophthalmia. The antirachitic substance was called vitamin-D, whilst the old term of vitamin-A was kept for the anti-xerophthalmic substance. Further evidence came from experiments with green spinach. Spinach was found to be rich in vitamin-A, but was not capable of preventing rickets. The irregular preventive action of vegetable oils against rickets then became explainable. They contained different quantities of vitamins-A and -D. Some contained much A and little or no D, whilst others had a little D but no A. The presence of vitamin-A in fats can be tested for by a special colour reaction devised by Rosenheim and Drummond. The test is not given by vitamin-D. Hence the occasional failure of fats showing the test to prevent rickets. They had vitamin-A, but not vitamin-D. The actual chemical work on the isolation

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how the ultra-violet rays acted. It was observed at the Lister Institute by Hume and Smith that rats did not get rickets if they were kept in cages which had been exposed to the action of ultra-violet light. The experiment could not be confirmed by other workers. The cages in the original experiment had sawdust as litter, and it was later observed that the rats ate the sawdust. Control rats in cages with non-irradiated sawdust suffered from rickets. Evidently something in the sawdust became antirachitic on exposure to the light.

Various foods known to lead to rickets were then tested. Some were found to become antirachitic after exposure to the ultra-violet rays. Further experiments showed that it was the fat, not the protein or carbohydrate, which became antirachitic. Examination of fats led to the activatable substance being located in the unsaponifiable fraction (Hess, Steenbock). Cholesterol was isolated from the fats and was found to be capable of activation. Other pure specimens of cholesterol from various sources could be similarly activated, but the power of activation was not constant, nor in proportion to the amount of cholesterol. Purification of pure cholesterol (Rosenheim, Heilbron) then showed that the pure substance contained very small quantities of an impurity. It was the impurity that was activated, and the impurity was next identified with ergosterol. Finally, pure ergosterol could be activated and minute quantities of irradiated ergosterol were able to cure and prevent rickets.

The information thus acquired reconciles the two different views as to the cause of rickets. Two factors are necessary for its prevention. The one is ergosterol in the food; the other is sunlight or ultra-violet rays. The one without the other is of no value.

Sunlight can activate ergosterol not only in the food of the animal, but also in the fat under the skin. Hence the better value of summer milk and other

of the vitamins also proves their difference.

The discovery of ergosterol by Rosenheim and Webster, its activation by ultra-violet light, and the demonstration of its preventive action against rickets is the most conspicuous work of the past year. It brings together the two opposing views of its causation: (a) diet (b) hygienic conditions.

Hygienic conditions had always been claimed to be a cause of rickets, such as bad housing, lack of fresh air and exercise, and also absence of sunlight. Many considered that sunlight was the actual preventive. Rickets is unknown in the tropics, and in temperate regions there is a distinct seasonal variation in the number of cases. There are more cases after the winter than after the summer, and most cases improve in the summer sunshine. The curative action of sunshine was fully proved. In Vienna this was found to be the case except in the severest cases, which were only curable by means of cod-liver oil.

The curative effect of ultra-violet light from a mercury vapour lamp was first described by Hulschinsky in 1920, and confirmation of his work has been made in Europe and in America. It has led to the so-called sunlight treatment in most hospitals, sometimes referred to as heliotherapy. The curative action of sunlight is due to the ultra-violet rays which it contains. Ultra-violet rays do not pass through ordinary glass, so that special glass (vitaglass) is necessary. Smoke and dust in the air absorb these rays; clean air and clean glass are therefore essential. The benefits of sunlight should be taken advantage of in the open air. These conditions explain the variation in the hygienic conditions which sometimes prevented rickets and sometimes did not. They were further confused with different dietary conditions.

The curative action of ultra-violet light led to careful and controlled experiments with animals to ascertain

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produced by its deficiency must be considered in two ways. The first from complete or nearly complete deficiency or *absence* of the vitamin; the second from partial deficiency or *shortage* or vitamin-underfeeding. Absence from the food of vitamin-B leads more or less quickly to beri-beri, which is commonly characterized by severe nervous and heart symptoms and digestive troubles. Two forms are described in man. In the "dry" form there is paralysis and great wasting of the limbs. In the "wet" form there is œdema of the lower limbs, in severe cases the trunk and arms are also affected. In birds the disease is known as polyneuritis, and is usually of the dry form. Though not often observed previously, we have in our own experiments seen the wet form in both fowls and pigeons. It has appeared when the bird has been on a diet with a shortage or too little vitamin-B, and the bird has lived for a considerable time before it has died.

Associated with the symptoms of paralysis the various internal organs are affected. The thymus, spleen, reproductive organs, pancreas, thyroid, kidneys, diminish in weight. The adrenals increase in size. McCarrison, who has studied the pathology of beri-beri in man and animals, describes the symptoms as occurring in a fairly definite order. Those appearing first are concerned with the digestive and endocrine systems, the last are in connection with the nervous system. He considered the earlier manifestations the more important. The signs were quite clear, but not always present in equal degree in all animals. The earlier signs were: Distaste for food, loss of appetite or depraved appetite; loss of weight, weakness and lack of vigour; indigestion, gastro-intestinal derangement, colitis, and intestinal fluxes; headache, anæmia, tendency to œdema, and unhealthy skin; subnormal temperature and cardio-vascular depression. Symptoms due to malnutrition of the nervous system may

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foods. They contain activated ergosterol or vitamin-D. Foods may contain either ergosterol or vitamin-D. Those with vitamin-D prevent rickets. Those with ergosterol require irradiation or irradiation of the animal. One would expect to be able to activate foods with ergosterol artificially, but there is the difficulty that over-irradiation spoils the vitamin and the food is not so palatable; at the same time any vitamin-A in the food is destroyed by the ultra-violet light.

Sunlight upon the body in the absence of ergosterol is valueless. Ergosterol must be supplied in sufficient quantity in the food in order that light can produce its effect. This latter condition is constantly neglected. Exposure to ultra-violet light is prescribed, and it is forgotten that ergosterol is another requisite. Dilution of foods, like milk, with water and sugar, cereal foods or flour is a factor leading to a too small consumption of ergosterol or vitamin-D.

VITAMIN-B.

Though not so striking, the recent work on vitamin-B is equally important in its clinical applications.

On the chemical side the isolation of the anti-beri-beri substance has apparently been effected by Jansen and Donath from rice polishings. The substance has the formula $C_6H_{10}ON_2$. A minute quantity (1 in 1,000,000 parts) was a preventive of paralysis in little birds. One part in 500,000 was considered as preventive of beri-beri in man. Other very potent preparations (0.027 to 0.05 mgm.) as a curative of pigeons have been made by Kinnersley and Peters from yeast. Though in most respects the preparations from yeast resemble the substance from rice polishings, there are some differences. The existence of vitamins as definite chemical substances can now no longer be denied. Scepticism can only be attributed to ignorance and prejudice.

In the case of vitamin-B it seems that the symptoms

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produced by its deficiency must be considered in two ways. The first from complete or nearly complete deficiency or *absence* of the vitamin; the second from partial deficiency or *shortage* or vitamin-underfeeding. Absence from the food of vitamin-B leads more or less quickly to beri-beri, which is commonly characterized by severe nervous and heart symptoms and digestive troubles. Two forms are described in man. In the "dry" form there is paralysis and great wasting of the limbs. In the "wet" form there is œdema of the lower limbs, in severe cases the trunk and arms are also affected. In birds the disease is known as polyn neuritis, and is usually of the dry form. Though not often observed previously, we have in our own experiments seen the wet form in both fowls and pigeons. It has appeared when the bird has been on a diet with a shortage or too little vitamin-B, and the bird has lived for a considerable time before it has died.

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complete the clinical picture.

Eijkmann, to whom our earliest investigations are due, was able to classify foods into two categories: Those preventing beri-beri or containing vitamin-B, and those not preventing, or without vitamin-B. A list of foods containing vitamin-B is given in the diagram (p. 11). Foods without vitamin-B were white rice, white flour, sago, tapioca.

The list of the foods is not, however, sufficient in the study of nutrition. It is essential to know how much vitamin-B is needed in the diet and how much is present in the different foods. It is not possible to give the amount of vitamin-B, but it is possible to standardize the various foods which contain it. In other words, the amount of a food with vitamin-B which must be added to a diet of white rice or white flour to prevent beri-beri can be ascertained. The amount of such foods required to cure a pigeon suffering from polyneuritis can also be found.

Experiments on standardizing foods containing vitamin-B were first made by Cooper and by Chick and Hume at the Lister Institute. They found the minimum daily ration which would prevent polyneuritis in a pigeon given 30 grams of white rice daily. Some of their data are :—

Wheat germ	- 1.5 gm.	Lentils	- - 3.0 gm.
Yeast extract	- 1.0 "	Barley	- - 3.7 "
Egg yolk	- - 3.0 "	Brain	- - 6.0 "
Liver - -	- 3.0 "	Muscle	- -20.0 "
Heart - -	- 3.0 "	Milk more than	35 "

It became the custom after these experiments to quote a definite daily quantity as satisfying the need of an animal for vitamin-B. The quantitative aspect has never been sufficiently realized nor even considered in the feeding of man or animals.

The work of Plimmer, Rosedale and Raymond, which was started to find out the vitamin requirements of chicks from the day of hatching to maturity, showed that

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a daily quantity of vitamin-B was not sufficient, but that the food consumed must be balanced by vitamin-B. It was not possible to rear the chicks unless the amount of vitamin-B in the food had a definite relationship to the food consumed. Other investigators had come across a similar relation. The question of balance seemed of such fundamental importance that the subsequent work was to test the question of balance with each class of food-stuff. The experiments with protein were not as clear as would be desired to give a definite answer to the question. The chicks appeared unable to tolerate large amounts of protein in the food. The experiments with fat were the clearest. With too little vitamin-B the chicks were never normal in appearance, and with still less they suffered from polyneuritis. With a sufficient supply of vitamin-B the birds were quite normal. The results were similar with the balance of carbohydrate. With too little it was not possible to rear them; with more they were abnormal, and with enough they were quite normal. Experiments were also made with pigeons. On small amounts of vitamin-B the birds died in a few weeks; with more vitamin-B their life was longer and with enough vitamin-B they could be maintained for over 30 weeks.

The vitamin-B requirements of rats were next tested. Rats were found to be more resistant to the effect of small quantities. They could be maintained on a quantity half as large as that needed by a pigeon.

Usually the requirements of man are considered to be like those of a rat. There are not sufficient data from which one can ascertain the quantity. It would be safer to place man's requirement between the rat and the pigeon. In terms of dried yeast, the quantities were chick 6, pigeon 4, rat 2 per cent. of a diet free from vitamin-B.

The result of these balance experiments is to show

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	Percentage amount needed in diet.	Comparative value of 100 parts.
Whole wheat, rye, barley	40	10
Almonds, chestnuts	40	10
Oatmeal, maize	50	8
Egg yolk	50	8
Potato, parsnip, artichoke	80	5
Leaf vegetables, tomato, celery, cauliflower, apricots, apples, coco-nut, contain only traces of vitamin-B.		

The experiments were made with a basis of white flour as the food, to which was added various amounts of the food to be tested. The figures in the above list are higher than those of Chick and Hume for the minimum quantity. Their standard time for the test was 15 weeks. As it had frequently been noticed that birds may fail in about 20 weeks it was necessary to take 26 weeks as the minimum time for the experiments.

The table of figures is useful for calculating the amount of vitamin-B that should be put into a diet. If we take 4 as the minimum figure, we have to find out how 4 parts are given by the various foods. Thus, 100 of wheat give 10, hence 40 parts will give 4; wheat 20 will give 2, egg 20 will give 1, and peanuts 10 will give 1. A diet of this latter mixture will supply enough vitamin-B.

An examination of the average daily diet containing white flour and sugar as the chief constituents points to an insufficiency of vitamin-B in the daily food. The amount of baker's yeast (2 per cent. or less) used in baking bread is not enough to supply sufficient vitamin-B to balance the food. The common belief that vegetables contain vitamin-B is erroneous. Potato and root vegetables contain a little, but only potato which forms a considerable part of the daily diet can be reckoned as a source of vitamin-B in the food.

Post-mortem Findings.—The birds and rats in the

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that :—

$$\frac{\text{Vitamin-B}}{\text{Total food}} = \text{a constant.}$$

This is true for an adult animal. It can be expressed as the more that is eaten the more vitamin-B is needed.

The ratio does not altogether satisfy the needs of a young animal. The experiments showed clearly that the young creature wanted more than the adult. It was repeatedly observed that young birds and rats could not be kept on the same amount of vitamin-B which sufficed for the adult. It is not known what is the exact function of vitamin-B. We have been led to suggest that its function is similar to that of protein. Protein is required for the replacement of wear and tear in the adult and for the growth of the young. This applies to the bulk of the material of the cell. We suggest that vitamin-B is a constituent of every cell, possibly of the nucleus. The adult cell needs vitamin-B for repair of the nucleus, the young animal needs vitamin-B for repair and for growth of new nuclei. The disturbance of the function of all the internal organs by shortage, or absence, of vitamin-B is further evidence that the vitamin is required by every cell.

With the need of a daily and comparatively large amount of vitamin-B as represented by 4 per cent. of dried yeast, it became of importance to analyse the ordinary foodstuffs for their vitamin-B. This work is still in progress, but a good many results are now available. They are given in the following table :—

Comparative Vitamin-B Value of Foodstuffs.

	Percentage amount needed in diet.	Comparative value of 100 parts.
Dried yeast - - - -	4	100
Wheat germ - - - -	8	50
Yeast extract - - - -	10	40
Baker's yeast - - - -	12	33
Peanuts, hazel nuts - -	20	20
Peas, beans, lentils, dry - -	30	13

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course of our experiments were kept on varying quantities of vitamin-B. The cause of death was looked for in all experiments, and an examination was made of those animals which survived. Only in a few cases did the birds show typical symptoms of polyneuritis. Polyneuritis was shown most clearly in those birds on the smallest amounts of vitamin-B. In those birds on small yet insufficient amounts the symptoms were in connection with the intestines or the heart or both. The intestines were filled with masses of pasty food residues often extending into the small intestine. The two appendices of the chickens were also usually filled with pasty food. Normally the intestines of chickens are almost empty under the same conditions. The livers were often pale and the hearts very frequently larger than the normal heart. There was sometimes fluid in the pericardium. Fluid was occasionally found in the body cavity and the tissues were very wet. In birds on an amount of vitamin-B approaching the proper amount the organs were covered with fat, and in several cases masses of fat could be picked out from the abdominal cavity. Such conditions are quite abnormal for young birds. In one experiment in which the organs were examined immediately after death the usual peristaltic movements could not be seen nor produced by stimulation, and the hearts showed fibrillation instead of normal beats on mechanical stimulation.

Altogether the symptoms coincide with those described by McCarrison as occurring in the early stages of beri-beri. In our experiments they are the final symptoms. The experiments show that they result from too little vitamin-B in the diet. The symptoms are chronic and coincide with the general outward appearance of the birds, which never looked like healthy chickens.

A distinction ought to be made between absence

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and shortage of vitamin-B. It is likely that many chronic ailments of man at the present time may be due to too little vitamin-B. Our observations with rats indicate that shortage was the cause of the death of the mother at the time of birth of her young. It has been proved that efficient lactation is only secured by three to five times the amount of vitamin-B in the diet as is needed by the adult animal.

Rheumatic conditions are also possibly due to too little vitamin-B in the diet. In this connection reference should be made to the valuable and important experiments of M. J. Rowlands, who studied the condition of the intestines and stomach in rats on diets with too little vitamin-B, largely in continuation of his work on chronic rheumatoid arthritis. Rats with too little vitamin-B showed a distinct degeneration of the mucous membrane and loss of the muscular coats of the wall of the small intestine.

As a result of the degeneration it was possible for micro-organisms to enter the lacteal spaces and thus gain entrance to the body from the alimentary canal. Control rats on diets with plenty of vitamin-B never showed such degeneration and micro-organisms were never found in the lacteal spaces. The experiments were started to find out how *Bacillus coli* reached the bladder, as Rowlands found this micro-organism in over 80 per cent. of his cases suffering from chronic rheumatoid arthritis. Too little vitamin-B thus appeared as a possible cause. Further experiments were made upon the condition of the stomach. With a shortage of vitamin-B there was marked distension and visceroposis. The animals were cured on being given extra vitamin-B in the food in the form of wheat germ, which is one of the foods most rich in this vitamin. There is also much circumstantial evidence of the benefit of taking extra vitamin-B. The average diet has too little vitamin-B, and it would be of interest to see if

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chemical nature. This vitamin is the least stable of the vitamins to heat and other influences. Under ordinary conditions drying of foods, ageing of foods, and cooking of foods destroys the substance.

Investigations have been carried out particularly with reference to the preservation of vitamin-C. Acid fruits, such as tomatoes and oranges, were known to preserve their vitamin-C if canned or concentrated in the absence of air. The process of canning has been studied more carefully. It has been found that if the canning be done in the absence of air the fruit, and in some cases the vegetable, does not lose its value. Canned fruit has been preserved for a long time and found to be of equal anti-scorbutic value to the fresh fruit. Further, on account of the absence of air in the canned material, the fruit can be heated before consumption without great loss of vitamin-C. At present every brand of canned fruit must not be assumed to be prepared in this careful way. No indication is given as to which brands contain vitamin-C, and it is better not to rely entirely on canned fruits as a source of vitamin-C in the diet.

The concentration of orange juice without loss of vitamin-C is effected *in vacuo*, and such a preparation is of value in Arctic expeditions and in long voyages. Certain milk powders have also been prepared with dried orange juice.

(Vitamin-D is dealt with on pages 13 to 16.)

an increase in its amount either by the use of wholemeal flour in all articles made with flour, or by adding wheat germ or yeast extract in ample quantities, would be of benefit in the new clinics which are being set up for the prevention of mortality at childbirth and for cases of rheumatism.

VITAMIN-B₂ OR PP.

The recent work of Goldberger has changed the idea that pellagra is caused by the absence of some amino acid in the proteins of the food to the idea that it is caused by the absence of a special substance which he called the PP or pellagra preventing factor. This factor is particularly abundant in yeast, and is present in smaller amounts in wheat germ, eggs, dried peas, fish and tomatoes. It is not the same unknown as vitamin-B, although the two unknowns are so commonly found in the same foodstuffs. A difference between the two unknowns is that vitamin-B is destroyed by heating with alkali, whilst the PP factor is stable to this treatment. Many foodstuffs seem to contain both factors, but there are distinct differences in their value as sources of vitamin-B and PP. To distinguish the two and not to change the nomenclature too much, the Medical Research Council (Vitamin Committee) has proposed that the anti-neuritic substance be called B₁ and the anti-pellagra substance be called B₂. Originally the anti-beri-beri substance was tested for as a preventive of polyneuritis in pigeons, and vitamin-B as a growth factor for rats. The latter is probably the PP factor.

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may lead to a wrong diagnosis of stone.

I once had the opportunity of seeing one of these kidneys operated upon by a London surgeon in a mistaken diagnosis of stone. It was a deep red colour, twice the normal size, looking ready to burst its capsule. When it was incised to look for a stone, blood poured out as if two or three jugular veins had been cut, and the surgeon put in deep sutures as soon as he could. The patient made a rapid recovery; possibly the incision in the kidney hastened it.

In very acute cases the ureter may be so swollen by the intense inflammation that very little urine may get through to the bladder from that kidney, and there may be only microscopic evidence of blood and pus cells and coli bacilli. Pyelo-nephritis in pregnancy occurs about the fourth or fifth month. It is usually of the acute type, with rigors and pain in one or both kidneys. In appendicitis it may give rise to continued pyrexia after the removal of the appendix, and so should be kept in mind.

Besides the acute cases, there are a much larger number of chronic cases. The symptoms are usually headache, lassitude, loss of energy, wasting, pains in joints and muscles, and slight intermittent pyrexia. In most of them there are practically no urinary symptoms, except a little frequency of micturition. The kidney, however, may be seriously damaged if the condition is allowed to persist; a destruction and sclerosis takes place, urea concentration sinks below 2 and blood urea increases. Œdema does not occur, but I have seen a death from uræmia in a lady who had not consulted a doctor until a week before she died, with her urine full of pus cells and coli bacilli. People who have "influenza" several times a year are often really cases of chronic *Bacillus coli* nephritis.

The urine is generally hazy and resembles shot silk when looked through. It often has a fishy smell, and is practically always acid. A satisfactory specimen for examination can be obtained without the use of a catheter by making the patient pass water into two

Bacillus Coli Nephritis.

By WALTER BROADBENT, M.D., F.R.C.P.

Senior Physician to the Royal Sussex County Hospital; Physician to the Royal Alexandra Hospital for Children, Brighton, etc.

BACILLUS COLI Nephritis, or Pyelo-Nephritis, is much commoner than used to be taught. It occurs frequently in babies and young children, nearly always girls, being a cause of recurring feverish attacks, anæmia, and general failure to make progress. It is often undiagnosed owing to the difficulty of getting specimens of urine; these can be obtained by asking the nurse to keep a pad of cotton wool between the thighs, and, when it gets wet, to squeeze it into a bottle. Pus and blood cells may be found in this. In middle life there are still more females affected than males, but in later life it is more often found in men with enlarged prostates. Predisposing causes are bowel infections, such as diarrhœa, colitis, appendicitis, constipation and pelvic operations. Also partial blocking of the ureters by tumours, pregnancy, vaginal prolapse, enlarged prostate and stricture.

The onset may be very acute with rigors, vomiting, pyrexia of 102° to 104° , headache, delirium and profuse hæmaturia. There may be renal pain and strangury, also a rigid and tender abdomen. One kidney only may be affected, and this more often the right. Renal pain may be in the front and back of one or both loins. Usually it is a constant ache, but occasionally it is like a colic. There is tenderness on palpation, and often the kidney can be felt to be enlarged. There is pain at the end of micturition in females, and in the penis in males. Also there is frequency of micturition. Profuse hæmaturia is not uncommon in acute pyelonephritis, and, when there is much pain in one kidney,

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BA^CILLUS COLI NEPHRITIS

every two hours until the urine is alkaline, and then every three or four hours as may be necessary to keep the urine alkaline, should be given. Every specimen of urine passed must be tested with litmus paper, since cure will be delayed if the urine is allowed to be acid at any time. After a fortnight of alkaline treatment, some recommend a change to hexamine and acid sodium phosphates; but I have not been able to convince myself that this change to hexamine is good in acute cases, as I have seen a return of hæmaturia during its use. In very severe cases, where one kidney is obviously enlarged, and the temperature and recurring rigors show that the inflammatory products are being dammed back in the kidney by a swollen ureter, an important advance in treatment is to pass a ureteric catheter up to the pelvis of the kidney through the cystoscope, and to leave the catheter there for several days to drain the kidney. Coli vaccines have, as a rule, little or no effect.

In chronic cases the alternation of courses of strong alkalis and the acid hexamine mixture certainly do good. Hexyl resorcinol or caprokol is also very useful in getting rid of the *Bacillus coli*. It is well to keep the kidneys flushed with plenty of liquid; a breakfast cup of tea or a tumbler of hot water is a good start for the day, and tea and coffee drinking should be encouraged. Since the intestine is the primary cause of most of these cases it is important to keep the bowels acting properly, and intestinal disinfectants help towards cure.

vessels, and using the second when the urethra has been washed out. If put into a conical glass for a quarter of an hour a direct film from this will show many motile bacilli and pus cells and often red blood corpuscles. There may be a bacilluria without any nephritis in general blood infections, the kidney acting as an excretor of the bacteria. This occurs in typhoid fever, in ptomaine poisoning and in Malta fever. Often there is a little albumen in the urine, but rarely more than is accounted for by the blood or pus.

Turning to the subject of diagnosis, pyelo-nephritis without bladder symptoms may be mistaken for influenza or malaria, unless the examination is careful. To differentiate it from stone it may in some cases be necessary to have an X-ray examination and cystoscopy. In perinephric abscess there is generally a hard tender swelling at the back of the loin. From pyonephrosis and tuberculous kidney the diagnosis is most easily made by cystoscopic examination, but there may be a mixed infection.

I had a child patient in the Children's Hospital with a typical attack of acute *Bacillus coli* nephritis, pain, shivering, high temperature, blood and pus and coli bacilli in the urine. After a few weeks' treatment the child was much better, but there was still pus in the urine. A further specimen was examined and tubercle bacilli were found. The right kidney was subsequently excised, being badly infiltrated with tubercle.

TREATMENT.

In regard to treatment, warmth is very important, and patients should be strictly confined to bed. Poulticing and cupping of the loins are useful. An endeavour should be made to wash the kidneys freely with water and alkalis. In most cases this can be done by the mouth, but if there is persistent vomiting potassium citrate can be given by the rectum. In the 24 hours six pints should be taken of water, milk and barley water, and tea. Potassium citrate in 60-grain doses, or a mixture of potassium citrate and bicarbonate,

BACILLUS COLI NEPHRITIS

every two hours until the urine is alkaline, and then every three or four hours as may be necessary to keep the urine alkaline, should be given. Every specimen of urine passed must be tested with litmus paper, since cure will be delayed if the urine is allowed to be acid at any time. After a fortnight of alkaline treatment, some recommend a change to hexamine and acid sodium phosphates; but I have not been able to convince myself that this change to hexamine is good in acute cases, as I have seen a return of hæmaturia during its use. In very severe cases, where one kidney is obviously enlarged, and the temperature and recurring rigors show that the inflammatory products are being dammed back in the kidney by a swollen ureter, an important advance in treatment is to pass a ureteric catheter up to the pelvis of the kidney through the cystoscope, and to leave the catheter there for several days to drain the kidney. Coli vaccines have, as a rule, little or no effect.

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The Wassermann Reaction.

By J. E. R. McDONAGH, F.R.C.S.

Surgeon to the London Lock Hospital; late Hunterian Professor to the Royal College of Surgeons, etc.

MORE has been said and written about the Wassermann reaction than about all the other reactions put together, despite the fact that its true nature is not generally known or appreciated, although it was described in the first volume of "The Nature of Disease,"¹ published in 1924.

The Wassermann reaction is not a specific reaction. It is to a fortuitous concurrence that it is most positive in syphilis, but positive reactions are obtained in other infections, to wit, malaria, leprosy, scarlet fever, etc., and in such conditions as pregnancy and chronic intestinal intoxication in non-syphilitic individuals. In pregnancy the reaction is apt to be paradoxical, that is to say, alternatively positive and negative, but from a close study of 500 cases a positive reaction was obtained in 5 per cent., and most of these were obtained in the later months. In 3,000 cases of familial chronic intestinal intoxication a positive reaction was obtained in 0.5 per cent. The reaction is determined by the chemico-physical changes the protein particles in the plasma undergo. Although the changes responsible for the reaction are determined in the first instance by the leucocytozoon syphilidis—not by the spirochaeta pallida as is usually stated—they are influenced by the state in which the protein particles happen to be when the infection is contracted. The chemico-physical changes are altered by treatment, which does

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not kill the parasites directly; protein particles once altered may perpetuate the change, although the agent producing it in the first instance vanishes and there is always a tendency for the chemico-physical changes the protein particles undergo to be cyclical, independent of the activity or otherwise of the syphilitic micro-organisms. Indeed, the cyclical change undergone may render dormant parasites active. Thus it comes about that a positive reaction may be obtained in the absence of syphilis and while the micro-organisms are dormant, and a negative reaction while the micro-organisms are active. Therefore, there is the inevitable conclusion that the Wassermann reaction cannot be used either as a gauge of cure, or as a regulator of treatment.

The Chemico-Physical Changes the Protein Particles Undergo to Produce a Positive Wassermann Reaction.—The syphilitic parasite is made up of protein particles, which differ from the protein particles in the plasma of the host by being confined to a definite area by a "cell-membrane," and by being more negatively charged. Owing to these differences the parasites on encountering the protein particles in the plasma of the host deprive them of electrons and subject them to dehydration. Other protein particles, to avoid being sent into true solution, draw their planets, of which electricity is one, closer to the nucleus, or sun, in which case the particles take up water, increase in size, and become relatively more acid—in short, they undergo hydration. It is not mainly to the increase of acidity that hydrated protein particles owe their peculiar properties; these depend upon the greed for electrons such particles display and mostly upon their ability to lower surface tension. Indeed, it is almost solely to the latter action that a positive Wassermann reaction is due. Although dehydrated protein particles are likewise avid for electrons, they can obtain them only from bodies which readily give

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is the state of electrical equilibrium maintained by normal protein particles. Should the protein particles in the serum tested be so hydrated as to cause agglutination and precipitation of normal protein particles (complement) when antigen is added, then the complement is destroyed and the reaction is positive. Although it is possible to see the destruction of complement with the ultra-microscope, it is not visible to the naked eye, and to render it so, it is necessary to add to the first part of the reaction what is known as a "hæmolytic system." In a hæmolytic system a sequence of events is unrolled as occurs in the human body when it is invaded by a micro-organism or a chemical intoxicant. A rabbit is injected with, or invaded by, the washed red blood-corpuscles of a sheep, a manoeuvre whereby the protein particles in the plasma of the former are subject to dehydration and hydration. Provided the hydration is not too marked, these protein particles, when removed from the body and added to some washed red blood-corpuscles of a sheep, turn the tables upon the corpuscles and subject them to dehydration, or what is termed "hæmolysis." But, no dehydration occurs if the protein particles are too hydrated, as they become on exposure to heat, a change which can be rectified provided normal protein particles (complement) are added. If the complement is destroyed in the first half of the experiment, there is none left over in the second half to nullify the hydration caused by heating the rabbit's immune serum or "amboceptor," as it is called; consequently, when the reaction is positive no hæmolysis occurs, and *vice versa*. Therefore, the Wassermann reaction is nothing more nor less than an expression of protein hydration, a chemico-physical change protein particles may undergo at the hands of both micro-organisms and chemical intoxicants.

Why the Leucocytozoon Syphilidis is the Micro-

up electrons, such as positively charged metals, and they cannot lower surface tension. This explains the rationale of treatment of early syphilis with positively charged arsenic, mercury, bismuth, etc. When hydrated protein particles acquire electrons they undergo dispersion; in other words, the large particles become divided and sub-divided into tiny particles, each of which becomes more negatively charged the smaller the size it reaches. Hydrated protein particles become dispersed only through the agency of negatively charged bodies, hence the reason for the employment of negatively charged arsenic (penta-valent arsenic compounds), sulphur, and iodine in late syphilis. It is to the loss of electrons that hydrated protein particles undergo the cyclical change of dispersion, a change which may result in the renewed activity of the syphilitic micro-organisms. Should the host's protein particles be dehydrated when the patient acquires syphilis, hydration results early and a papulo-erosive, indurated, dry, and non-inflammatory chancre develops, and the serum gives a positive reaction at once. Should the particles be hydrated beforehand, either dehydration occurs, or dispersion. If dehydration, the sore is of the papulo-ulcerative type, and if dispersion, of the phagedænic type. In both cases the advent of a positive Wassermann reaction is delayed, and in the latter case the reaction may never become positive and a spontaneous disappearance of the infection may result. In the first part of the Wassermann reaction the serum to be tested is heated, a manœuvre which increases hydration. A so-called "antigen" is then added, which only needs to be a body capable of lowering surface tension sufficiently to cause still further hydration, agglutination, and precipitation, in which are included the protein particles of the normal serum added under the name of "complement." Complement is a state and not a substance, as shown many years back;² it

The Treatment of Otorrhea: with a Comparison of the Various Methods.

By J. A. KEEN, M.B., F.R.C.S.

Aural Surgeon, Leicester Education Committee; Ear and Throat Specialist, Leicester Public Medical Service, etc.

OF all the methods of non-operative treatment of middle-ear suppuration, the one that is probably the most widely discussed at the present time is zinc ionization, as introduced in recent years by Dr. A. R. Friel.¹ Zinc ionization is being more and more used as a routine treatment in many school clinics, and also in fever hospitals all over the country, as can be seen from the yearly reports to the Education Authorities in important centres. It is undoubtedly successful in curing the discharge in a large number of ears where the condition might otherwise become chronic.

In Leicester the number of new cases of otorrhea which are yearly referred to the aurist for treatment is considerable (about 200), and with a limited number of weekly clinics available it was found impossible to treat every case at once by ionization, as this treatment takes a good deal of time. The simpler methods, which had gradually been evolved in the course of eight years' experience, seemed to give very satisfactory results. Therefore until recently I only treated selected and obstinate cases by ionization, particularly prior to deciding on the need for a mastoid operation.

The reports from clinics where ionization is practised

organism best able to cause a Degree of Hydration sufficient to make the Wassermann Reaction positive.— All pathogenic micro-organisms are negatively charged, but some are more so than others. This explains why they all have what are termed “reducing properties,” properties which make them stain with pyronin and decolorize tri-phenyl-methane dyestuffs and methyl-green in particular. The decolorization is due to a conversion of the dye into its leuco-base, a change which occurs when the dye loses an atom of electricity.³ It is owing to the difference in the negative charge that micro-organisms can be divided into gram-negative and gram-positive. The former are more negatively charged than the latter, and they fail to stain with methyl-violet, because this dye is converted into its leuco-base.⁴ All pathogenic protozoa are gram-negative, being more negatively charged than bacteria, and this explains why the former are more likely than the latter to take up an intra-cellular habitat, another phenomenon which is primarily dependent upon the ability of the invader to lower surface tension. The leucocytozoon syphilidis is probably the most negatively charged of all the pathogenic protozoa, as evidenced by the avidity with which the adult male phase (*spirochaeta pallida*) stains with methylene-red *in vivo*, and it explains why so many of the phases seek out endothelial cells in which to develop. Indeed, syphilis could not be the infection it is unless the causative micro-organism developed in the cells of the host.

References.

¹ McDonagh, “The Nature of Disease,” Part I. Chapter xv. William Heinemann, Ltd., London. (1924.)

² McDonagh, “The Biology and Treatment of Venereal Disease.” Harrison & Sons, London. (1915.)

³ McDonagh, “The Nature of Disease,” Part II. William Heinemann, Ltd., London. (1927.)

⁴ McDonagh, “The Nature of Disease,” Part I. Chapter iii. William Heinemann, Ltd., London. (1924.)

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after three to four days, then perhaps weekly, and so on until the ear is quite dry. Of all the various methods this is by far the simplest, and taken all round perhaps the most efficient, with the exception of ionization. Boracic powder insufflations for otorrhea were strongly recommended by Professor Bezold as long ago as 1880, i.e. even before the bacterial origin of this disease was known.²

No home treatment of any kind is ordered, and the mother is only allowed to wipe the outer part of the meatus with dry cotton wool; no cotton wool is kept in the ear unless the discharge is very profuse. The absolute futility of home syringing with boracic lotion and the constant use of peroxide drops will be obvious to any surgeon who attends the aural out-patients of a large hospital. It may not be possible to give the cases more individual attention, but it has always seemed to me that when the ear dries up under this stock treatment of syringing it heals in spite of treatment and not because of it.

On the other hand, certain rules must be impressed on the mother, and these are conveniently printed on a card of instructions. The ears should be kept absolutely dry. This is specially important with girls when the hair is being washed, and the hair should be kept short over the ears. Among the poorer classes one quite frequently sees matting of the hair over the discharging ear, and this must be a source of reinfection. Boys are forbidden the swimming baths, a frequent cause of recurrences particularly when a dry perforation is present. Many children blow their noses incorrectly, and constantly reinfect the middle ear *via* the Eustachian tubes; when instructed they readily grasp the point about blowing each nostril separately.

At the child's first attendance his nose and throat are examined and removal of tonsils and adenoids is

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as a routine treatment were so enthusiastic that we were urged to try zinc ionization also in our new cases, in the hope that the number of attendances could be much diminished. In order to decide this point we arranged in the early months of 1927 to treat one-half of our new cases by ionization as soon as possible after the first attendance. This gave an opportunity of making a strict and impartial comparison between the end-results where the ordinary forms of treatment were adopted, and those where one treatment by ionization was used as an additional measure.

I may state at once that the case for ionization as a routine treatment for otorrhea is by no means as strong as I was led to expect.

METHODS OF TREATMENT WITHOUT IONIZATION.

I may begin by describing briefly the routine treatment for middle-ear suppuration at our clinic, apart from ionization. The methods that can be adopted are very numerous, and they will vary with each individual surgeon. My own preference is for boracic powder insufflations. I see the patients twice weekly at the beginning of the treatment; later, when the discharge gets less profuse, at weekly or fortnightly intervals. At each attendance the meatus is carefully cleaned out with cotton-wool applicators; it is best to use wooden ones as these can be thrown away. The perforation is defined whenever possible, and a note made of any granulations or other evidence of chronicity, such as cholesteatoma. The method of removing the discharge by cotton-wool applicators is, I believe, just as efficient as syringing, and it avoids the possibility of spreading infection to the middle ear. The whole deeper portion of the meatus is then filled with boracic powder which is insufflated through a suitable powder-blower. This treatment is repeated

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advised whenever necessary and carried out as soon as possible. How far the pathology of middle-ear suppuration is influenced by nose and pharynx conditions is still difficult to assess, but we may easily exaggerate the importance of this connection.

In carrying out treatment for otorrhea, the boracic powder method can be supplemented by other measures, such as wiping out the meatus with rectified spirit before insufflating the powder, or packing the meatus with iodoform gauze, or using pyoktanin (an aniline dye identical with methyl violet) in absolute alcohol, as recommended in Vienna.

When a case does not seem to make progress with the boracic insufflations I try a change by using bismuth and iodoform powder, 1 to 2, the proportions being the same as in Bipp ointment.³ But this powder must be used more sparingly, and one should only try to get a thin coating of the drum membrane and meatus. The iodoform is said to liberate nascent iodine when in contact with the middle-ear discharges.

I believe that many otologists are still under the impression that the treatment by powder insufflations is dangerous; they fear that hard concretions may form, and that drainage may be obstructed, especially from small perforations in the attic region. This fear is quite groundless, and the matter is discussed in Bezold's text-book.² The boracic powder readily dissolves in the discharges, although the bismuth and iodoform powder does not. If a white concretion of boracic powder be seen in the deeper parts of the meatus, this is a welcome sign and it tells us that the middle ear has become quite dry. The small, hard mass may still be visible after many weeks, but it will eventually be removed by the natural shedding processes of the meatal skin. One should strongly resist the temptation to use the syringe. The boracic powder often hides a dry perforation, and the syringing may

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cause fresh otitis. If a recurrence should occur, a small mass of boracic, or even of bismuth and iodoform powder, could not possibly act as an obstruction any more than would, for example, a collection of dry scaly cerumen.

This is a brief outline of the treatment that may be used apart from ionization, and later when discussing results the cases treated thus are referred to as group I. The underlying principle is to seal off the middle ear as far as possible from reinfection, and not to hinder the natural healing processes. Reinfection *via* the Eustachian tube, on the one hand, is counteracted by dealing with septic tonsils and adenoids when necessary, and by correcting faulty nose-blowing; reinfection from the meatus, on the other hand, by the boracic powder insufflations, and by discontinuing watery lotions. Syringing, even by the surgeon himself or by a trained nurse, must definitely be considered harmful. However sterile the instruments or lotion, it is not possible to sterilize the skin of the meatus repeatedly, and organisms will be washed back into the middle ear. And, further, it is not possible to use strong antiseptics for syringing or in the form of drops, as prolonged use always causes irritation and eczema.

IONIZATION AS AN ADDITIONAL MEASURE.

Zinc ionization is an attempt to sterilize the whole middle-ear cavity. If this is successful, and reinfection does not occur, the ear becomes dry almost at once. The technique I used is that described by Friel.¹ There will be no special mention of "causes of chronicity" (Friel), because the cases were not selected in any way but treated as they came, taking every alternate case for ionization. This investigation is not an attempt to estimate the value of ionization in the treatment of otorrhea, but it is an attempt to

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estimate the relative value of ionization and of the older methods outlined above. I was generally able to apply the ionization treatment within a few days, or at most a week, after first seeing the child and before any other treatment had time to take effect. If the ear was not dry after the ionization, then treatment was continued in the same way as in group I.

There is one point which is rather important: I did not use the small attic cannula (Dundas Grant) in filling the middle ear with the zinc sulphate solution, because the manipulation is too delicate to be attempted in a small child who moves a good deal, and once he has been hurt any further treatment is difficult to carry out. Therefore I prefer to rely on careful cleansing and pressure on the tragus after filling the meatus with the solution. After repeated refilling and squeezing on the tragus the child often volunteers that he can taste the drops; some of the solution has penetrated down the Eustachian tube, and we may take this as a sign that it has also penetrated well into the recesses of the middle ear. Ionization is done in spite of the presence of eczema or a furuncle, which may be complicating the otorrhea; in fact, meatal conditions as well as the otitis seem to benefit greatly by the penetration of the zinc ions. The cases treated by ionization are referred to below as group II.

METHOD OF SELECTING AND GROUPING CASES.

All the new cases of simple otorrhea which came for treatment to the clinic between January and June 1927 were used in this investigation. They were treated by the ordinary methods or by ionization in strict alternation. The first case was not ionized, but this was decided by chance in order to avoid any possible selection; the same was done when we had to decide whether to ionize the right or left ear in the first case of double

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otorrhea, the order being reversed in the next one, and so on. In the list there are three cases of double otorrhea where one ear appears in group I and the other in group II. There were seven other cases where both ears were discharging, one ear profusely, the other only slightly. In these cases only the worse ear was included in the list. By the end of June seventy-seven cases had accumulated and the list was closed, ending with one of group II. One case towards the end of the list, a boy aged seven, with right otorrhea, did not attend when the ionization treatment had been arranged and the parents made difficulties about further attendances. This case was taken out of the list as well as the case preceding it, i.e. the "control"; that leaves seventy-five children, and as there were three double otorrheas, it means that we have seventy-eight cases of otorrhea where the end-result could be investigated. I decided to do this at the end of the year, when all the case cards were collected and divided into "controls" or group I, and ionization cases, or group II.

COMPARISON OF END-RESULTS.

The end-result of treatment in this investigation, therefore, means the condition of the middle ear after a minimum interval of six months from starting the treatment, with a few exceptions (seven cases) where a relapse occurred. When the ear has become dry the child reports for observation after two weeks, then again after a month, and is dismissed as remedied. If the child does not return in the subsequent period we may assume that the ear has remained dry. We are justified in doing this because in my experience the mothers are only too glad to return to the clinic, especially if the ear had been quickly remedied on a previous occasion. Also medical officers at their routine inspections, school nurses, and teachers will

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discover the eases and advise a return for treatment.

At the end of the six months' period, which we chose quite arbitrarily, sixty-six of the children (i.e. sixty-eight eases of otorrhea) had been dismissed as remedied, out of a total of seventy-eight, i.e. 87 per cent. Only one of the three eases of double otorrhea was remedied on both sides (No. 26, II, and No. 27, I). The other two are only remedied on one side, and these children are still under treatment at the end of the year. Of the sixty-eight, fifty-three have healed tympanic membranes, fifteen or 22 per cent. have dry perforations. Ten eases of discharging ears still remain under treatment after six months.

When we now come to compare the end-results in groups I and II, the parallel between the control (I) and ionization eases (II) is really extraordinary, considering the absolutely similar way in which the cases of otorrhea were distributed between the groups. Out of the ten non-remedied cases five remain on each side; or, to put it differently, out of thirty-nine in each group the same number, i.e. thirty-four, have been remedied. This means that the addition of ionization to the treatment has not produced any appreciable difference in the final results, at any rate in my hands. The numbers are sufficiently large to be able to state this quite definitely. But there is another aspect, and this concerns the number of attendances for treatment which are necessary, and here ionization shows a very decided advantage.

Taking all the cases together, the percentage of cures—namely, 87 per cent. remaining dry after a period of six months—may be considered satisfactory. It is encouraging when one remembers how obstinate otorrhea can be, and how unsatisfactory treatment generally is. The running ear has been called the "bugbear of aural practice" (Friel). In this series I have made no attempt to differentiate between the

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various forms of middle-car suppuration. The clinical entity of discharging ears in children is such a definite one that I need make no apology for considering them as one group.

CONCLUSION.

I have studied a series of cases of otorrhea in school children and have analysed the end-results after a period of six months. The children have been treated alternately by the ordinary methods, which are described, and by zinc ionization. I find that sixty-eight out of seventy-eight cases have been remedied, and have remained dry for at least six months. Both methods in my hands seem to have been equally efficient, but the ionization method is decidedly more rapid in its results. In only one case in this fairly large and representative group was a mastoid operation definitely advised. Some of the other persistent cases may possibly require operation later on, although none of them show granulations or evidence of cholesteatoma. The question which naturally arises is, What help can we get from the so-called conservative mastoid operation? I began my work as an aurist by being very impressed with the idea of early drainage of the antrum and mastoid cells, but in recent years I have practically abandoned this operation, as I feel that the cases where the ear becomes dry would also have got well by persevering with non-operative measures.

References.

¹ A. R. Friel, "Electric Ionization," 1922 edition, p. 108. Also *THE PRACTITIONER*, April, 1928.

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³ F. Stoker, "The Use of Bismuth and Iodoform in the Treatment of Chronic Suppurative Otitis Media," *Lancet*, August 2, 1919.

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At the end of the six months' period, which we chose quite arbitrarily, sixty-six of the children (i.e. sixty-eight cases of otorrhea) had been dismissed as remedied, out of a total of seventy-eight, i.e. 87 per cent. Only one of the three cases of double otorrhea was remedied on both sides (No. 26, II, and No. 27, I). The other two are only remedied on one side, and these children are still under treatment at the end of the year. Of the sixty-eight, fifty-three have healed tympanic membranes, fifteen or 22 per cent. have dry perforations. Ten cases of discharging ears still remain under treatment after six months.

When we now come to compare the end-results in groups I and II, the parallel between the control (I) and ionization cases (II) is really extraordinary, considering the absolutely similar way in which the cases of otorrhea were distributed between the groups. Out of the ten non-remedied cases five remain on each side; or, to put it differently, out of thirty-nine in each group the same number, i.e. thirty-four, have been remedied. This means that the addition of ionization to the treatment has not produced any appreciable difference in the final results, at any rate in my hands. The numbers are sufficiently large to be able to state this quite definitely. But there is another aspect, and this concerns the number of attendances for treatment which are necessary, and here ionization shows a very decided advantage.

Taking all the cases together, the percentage of cures—namely, 87 per cent. remaining dry after a period of six months—may be considered satisfactory. It is encouraging when one remembers how obstinate otorrhea can be, and how unsatisfactory treatment generally is. The running ear has been called the "bugbear of aural practice" (Friel). In this series I have made no attempt to differentiate between the

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Physical Signs.—It is not infrequent to find no physical signs at all in the early stages, but usually there is some corroboration of a suspicious history or mental state. I should be inclined to put a fine tremor of the lips, when the patient is asked to show his teeth, as the first sign. Tremor of the hands may be present, tremor of the tongue usually develops a little later. Some abnormality of the pupil is likely to be present. It may be of the Argyll-Robertson type, but more frequently the reaction to light is present though the reaction may not be so brisk as usual. Often the pupils are unequal or the outline is irregular. As so

Some Clinical Aspects of General Paralysis.

By H. S. LE MARQUAND, M.D., M.R.C.P.

Late Assistant Medical Officer, Maudsley Hospital, London.

GENERAL paralysis has always been a disease of considerable interest. The insidious onset years after the original infection, the varied course often showing dramatic changes, and the fatal termination have long been recognized. At the present moment particular interest is attached to the disease, for by newer methods of treatment much better results are obtained than was formerly the case. But these results are largely dependent on early recognition of the disorder so that treatment can be instituted before the nervous system has been extensively damaged. Thus the mode of onset of the disease has become of considerable importance to the general practitioner, who alone has the opportunity of early diagnosis.

MODES OF ONSET.

With Neurasthenic Symptoms.—This is the most common mode of onset of the disorder and at the same time leads to most mistakes in diagnosis. As in all disorders of the nervous system the highest functions are the first to suffer, so in general paralysis the faculties of reasoning and judgment are first affected and give rise to a series of subtle mental symptoms which can easily be mistaken for neurasthenia. This direct intellectual change is shown in many ways. The accurate income-tax assessor makes mistakes in his figures, or the merchant is at fault in buying his goods, one man being affected in one way and another in another according to his capabilities

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many normal people have unequal pupils the irregularity of outline is the more important sign. Loss of the normal pupillary unrest is said to occur early. The peculiar unemotional facies of general paralysis is very characteristic, and a loss of expression sometimes occurs before any other physical sign.

The knee-jerks are exaggerated and floppy in character, that is, a quick outward and backward excursion; but many neurasthenics closely resemble G.P.I.'s in this respect. Should there be any tabetic signs together with the mental symptoms the diagnosis is of course much easier; but it is important to note that tabetics may develop other forms of mental disorder which give in those cases a nice problem in diagnosis. For example, a patient was admitted very depressed and troubled with obsessional doubts on many matters. Physical signs of tabes were marked, and at first sight it was thought that the same infection was now affecting the higher centres and that he would develop into a G.P.I. But on careful inquiry into the history it appeared that his mental symptoms were a recurrence of a condition which had occurred not only before the date of the commencement of the tabes, but before the date of his primary syphilitic infection; the development of G.P.I. was thus rendered unlikely and the subsequent history showed that this view was correct. If no physical signs are found, the Wassermann reaction may yet put one on one's guard; but I shall return to this point later.

With Commission of some Crime.—It will be easily understood that the defect of judgment already described may lead the patient to perform some criminal act, and often the patient suffers the penalty of the law without his condition being suspected. Sullivan states that about thirty cases of G.P.I. among the petty offenders in England and Wales are certified insane every year. The crime is generally

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one of acquisitiveness often committed in a silly manner with little effort to escape detention.

One patient on discharge from the army joined the dock police of the Port of London Authority, but was soon dismissed for being found asleep on duty. After doing casual jobs for a time he had a succession of fits and was admitted to the infirmary, where his symptoms were attributed to the effects of a head wound received on service. But a skiagram of the skull showed no abnormality of the inner table. Mentally he was rather childish and fatuous, with a poor memory. His physical signs were limited to irregular outline of the pupils and to an absent ankle-jerk on one side. But his blood and cerebro-spinal fluid showed a markedly positive Wassermann reaction. The whole aspect of the case thus changed, both his fits and his previous misconduct helped to confirm the diagnosis of general paralysis.

With Maniacal Symptoms.—A patient who may or may not have shown some of the symptoms we have already mentioned suddenly shows all the signs of an acute maniac: he shouts, strips himself, becomes destructive and may be homicidal. G.P.I.'s when they become excited are more difficult to control than any other form of mania. They are entirely impervious to mild measures and mentally are far more like wild beasts than men. While the ordinary case of acute mania will pull himself together for a few moments to answer a question, the G.P.I. is incapable of doing anything but give way to whatever primitive instinct has for the moment the command of his disordered volition.

The worst case I ever saw shouted and jumped about continuously for four days and four nights; in that time he changed from a robust-looking man to an emaciated spectre not to be recognized as the same individual. He resisted all means of combating the excitement. Such a frenzy of excitement is almost limited to G.P.I. and to insane epileptics.

The possibility of G.P.I. being the cause of an acute maniacal attack in a man in the prime of life should make us hesitate in our prognosis when called to certify such a case. Acute mania is of excellent prognosis in the ordinary way, but when due to G.P.I. of course the matter takes on a different complexion. It is

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interesting to note that these maniacal cases not infrequently show remissions with temporary improvement in the physical signs.

With Melancholic Symptoms.—To pass to the opposite extreme, a patient may be brought by his relatives because of his marked depression; he has gradually become moody and seclusive; given up his work and perhaps threatened or attempted suicide. Even in that the lack of judgment characteristic of the G.P.I. may be shown, as in the oft-quoted case of the man who jumped into a river to drown himself but quickly scrambled out to avoid the risk of rheumatism. At first sight the patient appears to be a typical melancholic, but a depressed G.P.I. differs in several respects. The mental processes of the general paralytic show the essential dementia of the disease; the melancholic only exhibits retardation. The melancholic may take a long time to do an easy arithmetical problem, but he will not give a ridiculous answer. His delusions, if present, bear an obvious relation to his symptoms; because he is constipated he states that something has stopped up his bowels; the G.P.I., even when depressed, deals in superlatives, and will say that he contains a ton of faeces which he cannot pass. If the physical signs of G.P.I. are marked, the diagnosis is simple; even if they are not, the appearance of the patients differs. The melancholic will show a furrowed brow, an anxious face with a dry skin and diminution of all secretions. The expression of the G.P.I. always tends towards apathy, his skin is usually greasy and there is no diminution of secretions. The Wassermann reactions will usually clinch the diagnosis.

With Stupor.—Another very puzzling method of onset may be the sudden occurrence of stupor. This is not very common in the course of general paralysis, and it is certainly not the first thing one would think of when confronted with a stuporous patient.

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One of the most interesting cases of this kind had been quite well until a severe thunderstorm one night in the summer of 1923. Though in the prime of life he was very much upset by the storm, and remained so nervous that he was taken to a celebrated neurologist who sent him into hospital as a nervous breakdown, not finding any physical signs at all. In the hospital he at once relapsed into stupor, and no physical signs were found, so that he was regarded as the stupor of an acute confusional insanity precipitated by the thunderstorm. Under this diagnosis he lay for some months, taking his food but otherwise perfectly inert. Then, for some incidental reason, his blood Wassermann was examined and found to be positive, and likewise the C.S.F. He then commenced to improve, and left the hospital with no physical or mental signs of G.P.I. except his Wassermann reactions. He has since relapsed, and now shows typical signs of the disorder.

With Fits.—From the question of stupor it is natural to pass to the subject of the seizures that occur in the disease. Though usually associated with what is called the fat, fatuous and fitty stage, they may occur at any time and sometimes are the first sign. The seizures may resemble any of the types of epileptic or apoplectic fits, and in a man of thirty or forty with some suspicious signs the history of any kind of seizure is highly suggestive. Epilepsy may be diagnosed, but it is not common for idiopathic epilepsy to arise at that period of life. The seizures of G.P.I. very rarely show the definite stages of an epileptic fit and if repeated they usually vary in character and distribution. But the fit likely to cause the most difficulty in diagnosis is that which simulates the apoplectic fit.

The first case I saw of this kind is strongly impressed on my memory. While house physician at the Bethlem Hospital I was called to see a general paralytic who had just had a convulsive seizure. He appeared to have a left-sided hemiplegia, face, arm, and leg were all involved, and showed the ordinary typical signs such as extensor Babinski, and so on. The nurse who had fetched me to see the man said something about his being all right again in a day or two; and I remember wondering how a nurse could be so ignorant of the cause and course of an hemiplegia. The ignorance, however, was mine, and not his; for the next day the man was much improved, and within a few days he had regained normal power in his muscles and lost the physical signs of the paralysis.

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All the above symptoms have been described under modes of onset, not because they only occur then, but because if they do so the diagnosis of G.P.I. may be easily overlooked.

DIAGNOSIS AND THE WASSERMANN REACTIONS.

Whenever general paralysis is suspected, the Wassermann reactions are of the greatest help. It might be thought that in a disease limited to the parenchymatous elements of the nervous system the blood Wassermann would not be of great importance. Such, however, is not the case; the blood serum shows a heavily positive reaction almost always. In the pathological laboratory of the London County Council Mental Hospitals, where many sera of G.P.I.'s are examined weekly, an exception to this rule is scarcely ever found. It is always interesting to examine the cerebrospinal fluid which shows a very positive Wassermann reaction, a positive Lange's reaction and increased cells and albumen. These positive reactions with suspicious signs and symptoms are almost conclusive of the diagnosis of G.P.I.—almost but not quite, and the exception is important. General paralysis is regarded as a disease of the nerve elements in the nervous system, but the same train of signs and reactions may be caused by the spirochaete attacking the vessels and fibrous elements and secondarily affecting the nerve cells. There is a considerable controversy over the question whether one ever gets parenchymatous syphilis of the nervous system (i.e. G.P.I.) without any involvement of the blood vessels and other elements. But there is little doubt

that you get two distinct types of cases—the general paralytic in which the nerve elements are mainly affected and the cerebral syphilitic case in which the blood vessels and connective tissues are mainly involved.

In regard to prognosis, the distinction between the two groups is of great importance; the cerebral syphilitic may show considerable benefit from ordinary anti-syphilitic remedies, the general paralytic does not. It may well be asked, How can these two conditions be distinguished? The answer is that they usually cannot. The interstitial cerebral syphilitic has generally fewer mental symptoms and may show transient or permanent cranial nerve palsies. While the reactions of the fluids of the general paralytic almost always show a positive Wassermann, the interstitial syphilitic sometimes shows a negative reaction. As the interstitial syphilitic case shows benefit from treatment, so the reactions of his blood and C.S.F. become less positive; not so the general paralytic whose reactions are never influenced by the usual anti-syphilitic remedies. Diagnosis may in fact have to depend on whether there is a change in the C.S.F. following treatment. For these reasons I think that ordinary anti-syphilitic treatment should be employed in all cases of syphilis of the nervous system in the first instance.

TREATMENT.

By Malaria.—The results of treatment in the past have been very disappointing, but recently several methods have come to the fore which promise better results. One is the treatment by malaria injections, the technique of which has been described in several articles lately. The results appear to be much better than might be expected; a very much larger proportion of patients are being discharged from the asylums to their homes than formerly, and those who remain are not progressing as they formerly did. A

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The Operative Treatment of Exophthalmic and Toxic Goitre.

By DENNIS KENNEDY, F.R.C.S.I.

Surgeon to St. Vincent's Hospital, Dublin, etc.

THE idea exists pretty generally that the radical operation for the cure of exophthalmic and toxic goitre is attended with undue risks, and that the results in cases that recover from the operation do not justify the danger incurred. This prevents operative treatment being recommended or carried out in many cases. Consequently, it is worth inquiring impartially whether these ideas are justified and what basis exists for their justification; whether the danger and the indifferent results exist inherently in the operation or are due to the inexperience and faulty technique of the operator.

In all major operations broad principles have to be carefully observed, while the details are developed by the individual operator. In thyroidectomy, whether partial or complete, no such principles have so far been crystallized. Consequently, the operation is frequently carried out in a sort of haphazard fashion, the operator having no idea of the exact difficulties he is apt to encounter and of the best manner by which these can be prevented or dealt with should they arise: thus the risk to the patient is enormously increased. From a practical point of view the dangers of thyroidectomy are: (1) hæmorrhage; (2) shock; (3) anæsthetic; (4) acute thyroid poisoning after operation. I believe that if the operation is carried out on proper principles these dangers can be reduced to a minimum, if not

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G.P.I. ward in a mental hospital is, in the ordinary way, a most depressing place. The patients are mainly slovenly, fatuous and idle if they are not bedridden, and no one ever expects them to do any work. Since the advent of the malarial treatment a great change has been noted; even those who are not well enough to be discharged usually retain some interest in their surroundings and remain or become capable of a certain amount of routine work. This method is not very suitable for use in general practice owing to the precautions necessary to prevent the spread of malaria.

With Triparsamide.—This is a drug with a very complicated formula containing 24 per cent. of arsenic. It has been tried in America and in this country, and the results have been encouraging. The mental and physical state of the patient is usually improved provided the disease is not very advanced before treatment is instituted. It causes a definite change for the better in the reactions of the blood and the C.S.F., a result very difficult to achieve in general paralysis. Two or three grams of the drug are injected weekly for six weeks either intramuscularly or intravenously. Then a course of ordinary anti-syphilitic treatment is instituted, and six weeks later another course of triparsamide is begun. There is one precaution that must be taken, and that is to examine the optic discs before starting treatment, for the drug hastens optic atrophy and may cause blindness in that way. This treatment is very suitable for general practice and is worth trying in almost every case.

These methods of treatment are on trial, and though the results appear to compare very favourably with any methods of the past, it is not yet possible to say whether the results will be permanent.

I wish to thank Dr. Edward Mapother for permission to use material from the case-sheets of the Maudsley Hospital.

brings the required vessels into view, they are double ligatured, and cut between the ligatures. I believe it is better surgery to secure the vessels direct, than to be satisfied with polar ligation. It may be worth remembering that the superior thyroid vessels usually divide into two branches just as they reach the gland. Half the blood supply of the gland is at once secured. Still working inside the capsule, a little blunt dissection will free the gland from its posterior attachments. The gland is then lifted forward and rotated towards the opposite side of the neck. The inferior thyroid vessels are thus brought into view and can easily be secured. Once this is done the risk of hæmorrhage from any operation on that lobe is practically nil. If it is deemed advisable, as it usually will be in cases of toxic goitre, to remove portion of the other lobe, the blood supply of the second lobe should be dealt with in almost the same fashion. As much or as little of each lobe can then be removed with complete safety. The only difference is that the vessels after ligation need not be cut. I always remove one lobe and the isthmus completely, and anything from one-half to two-thirds of the remaining lobe. It is surprising what a small amount of the gland seems to be sufficient for the well-being of the patient. It may not always be possible to do the entire operation at once. In a small number of cases the second lobe will have to be dealt with at a second operation; but whether dealt with at the primary or second operation the key of success is the primary ligation of the blood supply.

As well as preventing hæmorrhage, this method of dealing with the blood supply prevents an excessive thyroid secretion being thrown into circulation from the manipulation of the gland during operation. Consequently, shock is lessened and the danger of post-operative thyroid poisoning practically disappears. Be-

altogether eliminated.

There is no doubt that the boggy of the operation to most operators is hæmorrhage; but if we examine the blood supply to the gland, we find that each lobe is supplied by two large vessels, the superior and inferior thyroids. When these reach the gland they at once begin to break up into numerous branches, and the closest analogy that one can give is that the thyroid gland becomes from this point of view nævoid tissue. If the gland is cut into before the vessels of supply are secured, profuse hæmorrhage is inevitable, and the seven dozen forceps that some operators provide themselves with in the operation will not be sufficient to save the patient's life. This tissue holds forceps or ligature very badly; consequently, as well as the profuse bleeding, the field of operation becomes covered with blood, the operator will probably get worried, and anything may happen. If, however, the vessels are secured before they enter the gland all this can be avoided. This is the first and the great principle essential to the success of the operation; consequently, a little detail as to how it is easily carried out may be useful.

TECHNIQUE OF OPERATION.

The usual Kocher incision through the skin and fascia is the best to make. The skin and fascia down to the muscles are then reflected upwards to the upper border of the thyroid lobes. The sternohyoid and sternothyroid muscles are then divided transversely to give a good exposure to the gland and its capsules. The capsule is freely cut. All the remaining steps of the operation are then carried out inside the capsule. In my practice I always secure first the superior thyroid vessels. This can be done by the upper pole of the gland being drawn down by the finger and thumb of the left hand of the operator, while his assistant retracts the muscles upwards and outwards. This

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sides, there will be no necessity for prolonged after-treatment. Once the patient has recovered from the operation, all symptoms of thyroid poisoning will have practically gone. By working inside the capsule of the gland the blood vessels are more easily exposed, and there is no danger of injury to the recurrent laryngeal nerves nor to the parathyroid bodies. If for any reason I am unable to secure the thyroid vessel in the manner described, I stop the operation.

About four years ago I was operating on a young clerical student for a very large toxic goitre. As I was exposing the superior thyroid vessels the anæsthetist became alarmed about the condition of the patient. As well-nigh no special provision had been made for the light of the operating theatre, I merely replaced the cut muscles and skin into position and sent the patient back to bed. The next morning I again brought the patient to the operating-table and completed the whole operation without a hitch.

As regards shock, I am sceptical as to the widespread accepted belief that the patient suffering from toxic goitre is infinitely more predisposed to the condition than other patients. The term has been used and is still being used to cover the results of faulty surgery. To inquire fully into this condition and its causes would require an article for itself. However, it may be stated that a good many of the causes that were supposed to be the pathological foundation of the trouble will not bear investigation. The primary failure of the heart muscles is now known not to be the cause of shock. Equally is it known that Crile's fantastic and plausible theory as to the exhaustion of the nerve cells of the central nervous system, which is brought about by the impulses due to the injury of the operative technique and conveyed by the nerves to the brain, is not true. Consequently, the elaborate technique that he built up and advocated for its prevention is now generally discredited.

We hear little now of the combined methods of local and general anæsthesia to prevent shock, and I should think few would resort to the humbug of giving

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pulse, and rapid respirations. It practically has not occurred in my cases where the thyroid vessels have been dealt with in the manner above described. If it does occur, the administration of a normal saline solution under the pectoral muscles quickly removes the trouble. As a preventive a small drainage tube or gauze wick left in the cavity from which the gland has been removed for 24 or 48 hours is very essential.

The object of this article is not to discuss the relative values of medical and surgical treatment for this disease. I believe that the combined efforts of physician and surgeon will be most beneficial to the patient. The physician's aid will be invaluable in getting the patient into the best condition for operation and in treating the distressing symptoms that are usually associated with the trouble. I find absolute rest in bed and the administration of lugol in ten-drop doses daily to be exceedingly useful. It has been observed, however, that lugol tends to lose its effect after a few weeks. With this I entirely agree. Sometimes a preliminary ligation of both superior thyroid arteries will be necessary to have the patient fit for the major operation. But so far it seems that no one drug or combination of drugs, nor any palliative line of treatment, has any permanent effect in checking the excess of thyroid secretion, which is the outstanding pathological factor in all these cases. As we are ignorant of the cause or causes which start the hyperthyroidism, the only logical thing to do is to remove all the gland that is not necessary for the proper metabolism of the individual.

The removal of the excessive gland is a major operation. The patient must be in a condition for a major operation, and the operator must be competent to carry out the principles of the operation properly. Given these conditions, there is no undue risk, and a rapid and complete cure is assured.

found the patient's condition much more unsatisfactory after this procedure than if I had given a general anaesthetic. I have no faith whatever in combined local and general anaesthesia. I think valuable time is lost without any material benefit to the patient. The only reason for it is Crile's theory of shock as to the exhaustion of the cells of the central nervous system. If this is incorrect, as I believe it is, combined local and general anaesthesia is worse than useless. I find that open ether well mixed with air or oxygen to be entirely satisfactory. The amount required is surprisingly small. After the skin incision no deep anaesthesia is required during the remainder of the operation. The patient is quite conscious before leaving the operating-table. A hypodermic injection of $\frac{1}{4}$ grain morphine and 1/100 grain atropine is invariably administered about 20 minutes previous to the operation.

It may be well to note that dyspnoea is likely to occur at one stage of the operation. To expose the inferior thyroid vessels the lobe of the gland has to be partially dislocated to the opposite side. This pulls upon the trachea and kinks it; dyspnoea is the result. If the cause is not recognized all attention may be directed to dealing with what is thought to be an overdose of the anaesthetic. Cynosis rapidly occurs and the patient may die. The trouble is at once stopped by the gland being replaced into its natural position.

An important detail in the operation is the accurate suturing of the muscles that have been cut transversely in the exposure of the thyroid gland. If these are not accurately approximated, a very ugly scar will be the result.

Post-operative trouble sometimes occurs due to acute thyroid poisoning. This is due to an excessive thyroid secretion being thrown into the circulation by the manipulation of the gland during the operation. It is characterized by a high temperature, a quick

pulse, and rapid respirations. It practically has not occurred in my cases where the thyroid vessels have been dealt with in the manner above described. If it does occur, the administration of a normal saline solution under the pectoral muscles quickly removes the trouble. As a preventive a small drainage tube or gauze wick left in the cavity from which the gland has been removed for 24 or 48 hours is very essential.

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Practical Notes.

The Treatment of Facial Carbuncle.

H. Bailey observes that carbuncle of the face has a sinister reputation, and the upper lip is the most common site of this dreaded lesion. A complication which quite frequently heralds the oncoming of a fatal pyæmia is thrombo-phlebitis of the cavernous sinus. In a series of fifteen consecutive cases of thrombo-phlebitis of the cavernous sinus, the author found that four were due to a furuncle or carbuncle of the upper lip, and that three more originated in an infected gnat bite of the nose. The angular vein, forming as it does a communicating link between the venous radicles of the upper lip and the ophthalmic plexus, constitutes the main channel by which infection passes into the venous system. To forestall the spread of infection by this route, ligation of the angular veins is a sound proposition, but it must be done under local anæsthesia, the risks of general anæsthesia being too great in a febrile patient whose buccal cavity is swarming with virulent organisms. A guide as to the most opportune moment for this intervention is the development of a spreading œdema from the lip to the inner canthus, which is usually unilateral. If, in addition to this sign, there is considerable elevation of temperature, the call for action is imperative. As regards the local treatment of the carbuncle, Mr. Bailey has given up incision, and simply injects the patient's own blood into the tissues around the carbuncle and applies hot, moist dressings.—(*Surgery, Gynecology and Obstetrics*, April, 1928, p. 565.)

The Treatment of Furuncles and Carbuncles.

F. Christopher publishes a critical review of the treatment of furuncles and carbuncles, with a bibliography comprising 127 references to literature within the past five years. He concludes that there are no inelastic rules governing the treatment of these types of infection. The high morbidity of furuncles and carbuncles and the mortality of the latter, particularly those on the face, demand the most serious thought and discrimination in the choice of treatment. In our present state of knowledge, the safest treatment is that which best brings about localization of the infection if possible, effective drainage and rapid healing. Surgeons will await with interest further reports on autogenous blood circum-injection and the criteria which govern its use. In large carbuncles, diabetic and non-diabetic, the treatment of choice is radical surgery. Most furuncles are best treated by conservative measures (hot, moist dressings, softening ingredients, carbolicization, etc.), until they discharge spontaneously or until fluctuation indicates incision and drainage. In certain small carbuncles, conservative measures

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are justifiable for from 24 to 48 hours. If there is no improvement at the end of that time, surgery is to be advised.—(*Surgery, Gynecology and Obstetrics*, May, 1928, p. 345.)

The Intra-uterine Injection of Lipiodol.

C. Bécclère reports the results of the study of 100 cases of intra-uterine injection of lipiodol. This method helps in the diagnosis of a uterine displacement and of a pelvic tumour in close relation with the uterus; but the most interesting observation is the study of the permeability of the Fallopian tubes, which is clearly shown by this method. The author is of opinion that impermeable Fallopian tubes are one of the most common causes of sterility. The treatment of this condition which he recommends, and which in his hands has given good results, is salpingo-uterostomy with resection of the obliterated segment of the tube.—(*Le Progrès Médical*, March 24, 1928, p. 507.)

Local Anæsthesia in the Removal of Hæmorrhoids.

J. A. Wessler employs the following technique in the removal of hæmorrhoids. After the usual preparation of the patient, the sphincters are anæsthetized with a solution of novocaine 1 per cent., and diluted. The most dependent hæmorrhoid is injected from its base to apex with a solution of quinine and urea hydrochloride 1 per cent., and coagulen 3 per cent., prepared by adding 1½ c.cm. or one ampoule of coagulen to each 5 c.cm. of quinine and urea. The injection is carried on to a point of distention and blanching of the tissue. The hæmorrhoid is then grasped with a Murphy hæmostatic forceps and pulled down. The skin and pile tissue are then divided at the mucocutaneous junction and a heavy linen thread passed beneath the pedicle, and the entire hæmorrhoid with the adjacent relaxed mucosa is drawn downward and outward as far as possible and ligated; it is then cut off, leaving enough stump to prevent slipping of the ligature. Each individual hæmorrhoid is treated in a like manner, and the after-care is the same as usual. The advantages of this procedure are that the quinine and urea hydrochloride have a prolonged anæsthetic effect, sometimes lasting two to five days, and when used in weak solution (1 per cent.) there are no untoward after-effects such as œdema or sloughing; the coagulen (a solution of thrombokinase isolated from blood platelets) prevents secondary hæmorrhage as well as providing a nearly bloodless operative field.—(*Medical Journal and Record* [New York], March 21, 1928, p. 310.)

The Treatment of Stomatitis.

C. Ruppe divides stomatitis into toxic stomatitis, stomatitis from general causes, and stomatitis caused by local conditions, and gives details of the different types. As regards treatment, in addition to treating the cause of the condition, local treatment is necessary. Mouth washes of Dakin's solution, sodium borate, potassium chlorate, or weak carbolic acid solutions are useful;

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The Treatment of Locomotor Ataxy.

D. Paulian reports nine cases of locomotor ataxy benefited by infecting them with malaria, as is done in general paralysis. He employs the intravenous route, as the incubation period is shorter by this method, and the quartan or tertian strain is used. During the attacks of fever the heart is stimulated and the temperature prevented from rising too high, by employing drugs which do not affect the malaria parasite. Gastric crises are often troublesome during the treatment, but subside afterwards.—(*Paris Médical*, March 10, 1928, p. 231.)

Cisternal Puncture as a Routine Diagnostic Test in Preference to Lumbar Puncture.

L. Spiegel insists that there is no greater danger in cisternal (suboccipital) puncture than with lumbar puncture if the proper technique is employed, and after preliminary study on the cadaver. Cisternal puncture is much less painful than lumbar puncture; in most cases it is almost painless. Meningismus is never observed, headaches are mild and last but a few hours when they do occur. Blood very seldom contaminates the fluid, much less often than in lumbar puncture. No local anæsthetic is required, but a special needle with a guard should be employed.—(*Medical Journal and Record* [New York], April 18, 1928, p. 411.)

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E. Lauda discusses the difficulties in the diagnosis of simple herpes zoster in the pre-vesicular stages, when only intense root pain is present, and points out that such serious conditions as spinal caries, spinal tumour and gummatous meningitis have then to be considered. Once the diagnosis has been made, the pain may be relieved by injection of a 1 per cent. solution of cocaine over the affected root area. For the constitutional symptoms which may take the form of fever and headache, Dr. Lauda considers that there is nothing better than the simple salicylate preparations of aspirin or sodium salicylate. A light protective dressing of zinc oxide and starch powder is usually all that is required to allay the irritation and burning sensation of the vesicular eruption, but if secondary infection of the vesicles takes place hot fomentations are recommended. Subsequent delay in the healing of the vesicles may be hastened by the application of a 1 to 2 per cent. Scharlach red ointment, whilst occasionally excessive formation of granulation tissue may need the use of a 0·5 per cent. silver nitrate ointment. To

hydrogen peroxide should be employed in a watery solution along with sodium borate, and not used alone. When the spirilla of Vincent's disease are present methylene blue or novarsenobenzol are most useful, and perborate of soda is also recommended. Any ulcers present may have to be touched with chromic acid, trichloroacetic acid, or lactic acid. If the stomatitis is severe and the bone of the jaw is affected, the author insists that surgical intervention should not be hasty.—(*Gazette des Hôpitaux*, April 21, 1928, p. 589.)

The Place of Vaginal Cæsarean Section in Obstetrics.

L. E. Phaneuf has come to the conclusion that vaginal cæsarean section is a useful operation when an indication for immediate delivery arises in a gravida with a long, rigid, undilated cervix, up to the end of the eighth month of gestation. The operation may be done at term, but here the difficulties are greater and there is danger of the incisions tearing in the peritoneal cavity because of the large size of the child. Since the operation is extraperitoneal, post-operative complications are negligible. The low transperitoneal abdominal cervical cæsarean section, which offers nearly as much protection against infection as does the vaginal hysterectomy, has displaced the latter operation in a number of clinics because of its simpler technique.—(*American Journal of Obstetrics and Gynecology*, March, 1928, p. 325.)

The After-effects of Toxæmia of Pregnancy.

F. E. Clow states that toxic pregnancy in a considerable proportion of cases leaves significant after-effects, frequently occurring at a time considerably distant from the acute events. These women demand careful attention in the years following their complications. Those in the group comprising types which have not a complete return to normal health following toxic pregnancy should probably not, except for good reason, risk future child-bearing. The reaction of certain women to pregnancy is such that the future may necessitate a change in the indications for the interruption of pregnancy for the sake of mothers constitutionally unfit to bear the strain of gestation.—(*New England Journal of Medicine*, April 5, 1928, p. 351.)

The Treatment of Cancer of the Tongue.

G. Menegaux discusses the treatment of cancer of the tongue, comparing the results in 78 cases which were operated upon in the clinic of Professor Lenormant with the results in 91 cases treated by radiotherapy in the clinic of Professor Proust. Removal of the growth and of the glands on the affected side resulted in a mortality of 15·7 per cent., with 10 per cent. of cures and 74 per cent. of failures. When the glands were removed on both sides as well as removal of the growth there was a mortality of 33·3 per cent., with 14 per cent. of cures and 52 per cent. of failures. When operative treatment was combined with radiotherapy there was a mortality of 35·5 per cent., with 20 per cent. of cures and 46·5 per

PRACTICAL NOTES

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relieve the neuralgic pain which so often persists in older subjects after the disappearance of the vesicles pyramidon together with the salicylate should be tried. If drug treatment fails, diathermy may prove successful in some cases.—(*Wiener Klinische Wochenschrift*, April 12, 1928, p. 530.)

The Treatment of Chronic Skin Conditions by Insulin.

S. Neumark considers that insulin may be very useful in the treatment of those skin lesions in which a high blood sugar is present, this pointing to a functional disturbance of the glands of internal secretion, or in those in which there is no hyperglycæmia but a relative acidosis or diminution of the alkali reserve in the blood. One case quoted by Dr. Neumark as an illustration of the second group had had generalized psoriasis which had resisted all attempts at permanent cure for three years. Twenty units of insulin were given per day until in all 250 units had been taken. Improvement was noticed a short time after the treatment began and two months later the eruption had disappeared entirely. In this case, although the blood sugar had never been above normal, there was at the commencement of the insulin treatment a definite hypercholesteræmia. During treatment the blood cholesterol fell to within normal limits. Cases of generalized eczema treated with insulin varied in respect of the amount of healing of the ulceration, but in nearly every case the irritation was greatly relieved.—(*Dermatologische Wochenschrift*, April 21, 1928, p. 525.)

Rectal Administration of Digitalis.

R. F. Weiss claims that rectal administration has a clearly defined place in digitalis therapy. He considers that there are certain indications for its use, and enumerates these as intolerance to oral administration, evidenced by "digitalis dyspepsia"; advanced congestion of the liver; severe cases of uncompensated heart disease in which it is impossible or impractical to give intravenous injections; and particularly those cases of heart disease characterized by the early onset of pulmonary and hepatic congestion with much cyanosis and dyspnoea in which oedema appears either late or not at all. The digitalis may be given either in the form of a small enema with water or as a suppository. The advantage of the latter is that it is easily managed by the patient himself and the exact dose taken is known.—(*Medizinische Welt*, February 25, 1928, p. 291.)

The Conservative Treatment of Eclampsia.

J. Sahler thinks that the majority of cases of eclampsia can be treated at home by conservative measures, the mortality in these cases being less than in those subjected to operation. To control the fits, morphia and sodium luminal narcosis is induced in the following manner: 0.02 gram of morphia is given subcutaneously as soon as the patient is seen; one hour later 0.4 gram of sodium luminal (or 2 c.cm. of a 20 per cent. solution) is given intramuscularly;

two hours later, 0.01 to 0.015 gram of morphia, followed four hours afterwards by 0.3 to 0.4 gram of sodium luminal. After a further six hours, 0.015 gram of morphia or 0.2 to 0.4 gram of sodium luminal is given. Finally, eight hours later a similar dose of the luminal is given. The substitution of sodium luminal for the chloral hydrate usually employed has the advantage that the luminal does not act as a cardiac depressant. If the blood-pressure rises above 140 mm. Dr. Sahler withdraws 600 to 800 c.cm. of blood from a vein, and unless the patient shows signs of dropsy, introduces 500 c.cm. of a 10 per cent. or 300 c.cm. of a 20 per cent. glucose solution. Lumbar puncture and withdrawal of 30 to 50 c.cm. of cerebro-spinal fluid may also be of value in reducing the blood-pressure.—(*Wiener Klinische Wochenschrift*, April 19, 1928, p. 564.)

The Diagnosis of Pregnancy.

A. Bonaccorsi reports a new method of diagnosing pregnancy, which in his hands has proved successful in 24 out of 25 cases of pregnancy in the first three months, and in 12 out of 15 cases of abortion before the third month; the method was negative in 16 control cases of women with various diseases, and also in 4 cases of women beyond the third month of pregnancy, as the test appears only to be of value in the first three months of pregnancy. An injection is made in the gluteal region, before breakfast, of 2 to 3 milligrams of phlorhizin and 1 milligram of eucaine hydrochloride. The urine is tested in half an hour, one hour, and one and a-half hours after the injection, a control examination of the urine having been done previously; the test is supposed to depend on the hypersensitive kidney epithelium of the pregnant woman in the early months of pregnancy.—(*Clinica Obstetrica*, February, 1928, p. 61.)

The Treatment of Mouth and Face Conditions by Irradiation.

I. I. Kaplan notes that the question of whether surgery or irradiation should be used in the treatment of malignant conditions about the mouth and face presents many difficulties. At Bellevue Hospital, New York, the burden of treatment in such cases has been placed on radiation treatment, the principle on which the method is based being small doses heavily filtered, over a long period of time. The method employed is a combination of deep X-ray therapy and irradiation by radium emanation. The radium treatment is carried out with long platinum filter needles for puncture procedures, and wax moulds with heavily filtered applicators for surface applications. In all cases biopsy is done following preliminary mouth hygiene and disinfection. The reaction after treatment is never very severe, and necrosis seldom occurs.—(*American Journal of Roentgenology*, May 1928, p. 437.)

Reviews of Books.

Clinical Examination of the Nervous System. By G. H. MONRAD-KROHN, M.D., F.R.C.P. Pp. 209. Fourth edition. London: H. K. Lewis & Co., Ltd. 7s. 6d. net.

THE appearance of a fourth edition of this book within two years of the publication of the third is strong evidence of its usefulness. The present issue has been revised and various additions have been made—particularly a chapter on the interpretation of X-ray pictures of the skull. While it is of convenient pocket size, the book contains a detailed scheme for a systematic examination of the nervous system, facilitated by many excellent illustrations and diagrams. It is intended primarily for the house physician, the general practitioner, and those beginning to specialize in neurology, and to all these it can be strongly recommended as a concise yet comprehensive volume.

Clinical Pediatrics. Edited by PROFESSOR R. S. HAYNES, Columbia University. Volumes XI-XV. London: D. Appleton & Co. 16s. per volume.

A FURTHER instalment of this work is now issued, the five volumes before us dealing respectively with the Diseases of the Blood, the Internal Secretory System and Metabolism, Infant and Child Feeding, Infectious Diseases, and the Surgery of Childhood. Each of these substantial subjects is treated by a physician who has made a reputation in the branch with which he deals, and these writers are in the enviable position that space in which to discuss their material is amply provided. Thus these five volumes comprise at least 1,400 pages, and, though only a fifth of the entire work, are in themselves longer than the great majority of textbooks. They are fully illustrated and for the most part with illustrations which really do perform the function of illustrating the text, which is often not the case in medical books published in the United States. The colour plates in the Blood volume are especially to be commended. The scheme of the work, in which each volume is intended to be a whole which can be purchased separately, necessarily leads to a certain amount of repetition, but since in clinical medicine there is room for a legitimate difference of opinion upon disputed points it is no bad thing to have the separate and detailed views of different writers. The printing and general appearance of these books are attractive, and the editing and proof-reading have stood a fair test. On the whole, these volumes fully sustain the standard of their predecessors, and the selected references at the end of the various sections form a valuable aid to the physician who wishes to pursue any subject beyond the range which is possible in a short article. There is one statement which in the opinion of the present reviewer can only be characterized as amazing. In the article on tuberculosis the writer quotes apparently with approval a statement: "That, where a positive Mantoux test is obtained in

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an infant under six months of age, in 75 per cent. fatal tuberculosis will develop within the first year of life." It is, of course, true that tuberculosis in the first two years is apt to be sudden in its onset and very severe, but the experience of other competent observers is directly opposed to the conclusion as above stated.

The Problem of Lay-Analysis. By SIGMUND FREUD, with an Introduction by DR. S. FERENCZI. Pp. 316. London: Brentano's. 10s. 6d. net.

THIS book consists of two of Freud's recent studies. The first—which gives its name to the volume—is a plea for allowing psycho-analysis to be undertaken by non-medically qualified persons provided they have had special training in analysis. Such treatment is not permitted in Austria, but in this country, where anyone may undertake any form of treatment, the question has only an academic interest. The second part (which is better translated by James Strachey) is entitled *An Autobiographical Study*, and possesses a more general interest. Freud here gives some account of his early life and of the first investigations with Breuer which ultimately led him to the theory and practice of psycho-analysis. The later developments, which at various stages caused some of his adherents to break away from him and found distinct schools of thought, are also described without bias or bitterness. As with so many innovators, Freud had to make his way against misrepresentation and prejudice, and this little account of his struggles will appeal by its candour and fairness even to those who still reject his views.

The Development of the Human Eye. By IDA C. MANN, M.B., B.S., F.R.C.S. With a foreword by SIR JOHN HERBERT PARSONS, C.B.E., M.B., F.R.C.S., F.R.S. Pp. 306. 241 illustrations. London: Cambridge University Press. 36s. net.

UNTIL the publication of this book there had not been any comprehensive monograph in the English language devoted to the embryology of the human eye, though, of course, general accounts, usually more or less superficial, are to be found in most treatises on anatomy. Miss Ida Mann must be congratulated, therefore, on the appearance of this well-produced and excellently illustrated volume—the author, who is also the artist, makes an altogether unnecessary apology that the illustrations are not by a professional artist; her work has gained and not lost by this. In turn the author discusses the early stages of the formation of the primary optic vesicle; the development of the optic vesicle and the associated mesoderm; the development of the lens, the neural ectoderm, the vitreous and suspensory ligament of the lens, the associated mesoderm, the orbit and its contents; the phylogenetic development and morphology of the eye; concluding with a synoptic comparison of ocular with general development. Many details are given that so far have failed to make their way into textbooks, though they may be found scattered in the multitudinous literature of the subject. There is a comprehensive bibliography and a good index.

Preparations, Inventions, Etc.

CITOBARYUM.

(London : Messrs. H. R. Napp, Ltd., 3 and 4, Clements Inn, Kingsway, W.C.2.)

Citobaryum is a convenient and palatable form of barium sulphate, prepared ready for taking, with the addition of water only, as a barium meal for X-ray diagnosis. It is rapidly made into a smooth paste, free from objectionable grittiness and sedimentation, and its uniform consistency ensures a clear, even shadow which gives an unbroken picture both on screen examination and skiagram. Gastric excretion is comparatively rapid, the ordinarily healthy stomach being completely emptied after 1 to 1½ hours, and constipation or other unpleasant effects are not observed.

"HEALTHY WINDOWS."

(London : Vita Glass Marketing Board, Aldwych House, W.C.2.)

"Healthy Windows" is the title of an interesting little brochure. Every practitioner knows by now that ordinary window glass permits the passage of only some of the ultra-violet rays, but is opaque to rays of 3,150 A.U. (Angström unit) or below, while the greatest beneficial effects of sunlight are obtainable only when the vital rays between 3,150 and 2,910 wave-lengths are present. Vita Glass is a practical and inexpensive glass permeable to the health rays, transmitting radiation to the farthest limits of the sun's spectrum and somewhat beyond. We are interested to find in "Healthy Windows" the extent to which this new glass is already in use. It has already been installed by 15 big hotels, by 12 horticulturists, including Kew Gardens and the Royal Botanical Gardens, Edinburgh, by the London Zoo and the Dublin Zoo, by 32 schools, and by no fewer than 65 important hospitals at home and abroad.

SIMPLEX ASEPTIC CLINICAL THERMOMETER.

(London : Messrs. Coates & Cooper, 41, Great Tower Street, E.C.3.)

One of the most difficult everyday problems for the practitioner is to ensure that his thermometer is always aseptic, and this difficulty becomes particularly acute during epidemics. Several thermometers have appeared on the market from time to time with the intention of overcoming this problem, with greater or less success. The Simplex thermometer appears, however, to have a number of advantages over others that we have seen. First, it is absolutely safe from infection; next, no matter in what position it is placed the thermometer case cannot leak; again, the thermometer itself is completely protected; and last, it is durable and quite convenient to carry. The Simplex thermometer is not much thicker than a fountain pen and can easily be clipped in the waistcoat pocket. The price is eight shillings and sixpence.

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AUGUST

1928

Lichen Planus.

By E. G. GRAHAM LITTLE, M.D., F.R.C.P.

Member of Parliament for the University of London ; Physician for Diseases of the Skin, and Lecturer on Dermatology, St. Mary's Hospital, etc.

LICHEN planus unfortunately remains a disease of obscure causation, although its very salient characteristics make it one of the easiest of skin diseases to diagnose. It is somewhat of a melancholy reflection that during the last thirty years set debates organized to discuss this disease have not been able to add any important new knowledge to the elucidation of its causation. I have been long enough in the practice of dermatology to have participated in two of these debates: one in 1900 at the house of Dr. Radcliffe Crocker, who opened the discussion, and one at the "Victory Congress" of the American Dermatological Association in 1919, at which I had the honour of inaugurating the debate. Now we have to record a third stocktaking of knowledge upon this subject, at the meeting of "French-speaking dermatologists" at Strassburg, in 1927, under the presidency of Professor Pautrier, and the information which I now propose to give in this article is in some measure

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in my cases, 171 females to about 100 in males, represents something like the proportion in England. Lichen planus is not found in very young children, the youngest age in my own list being four years. On the other hand, it may be seen at quite advanced ages, the oldest in my list being eighty-one; but the curve of greatest frequency is between thirty-five and fifty, i.e. the interval between the ages of thirty-five and fifty marks the apex of the curve of frequency. The social position of the patient is another very curious factor. Lichen planus is much more commonly found in private practice than in hospital practice, and there is a distinct association with persons of marked intellectual ability and highly-strung temperament.

The mode of onset is, as a rule, that of a chronic extension, spreading from certain centres, the commonest perhaps being the inside of the knees, the fronts of the wrists and the nape of the neck. It may, however, be acute, and it is more difficult to diagnose in the acute stage. Quite recently I saw a case which came out almost like a specific fever, and the diagnosis was rendered difficult by the remarkable rapidity of the spread of the eruption.

It is important to recognize the initial lesion, because it is so highly characteristic that if you once get it firmly established in your mind's eye you can hardly be mistaken in making the diagnosis of lichen planus. The characteristic lesion is the flat papule, which gives the disease its name. The papule is a particular colour, pinkish-blue, or bluish-red in early stages; later, it commonly becomes darker in colour and may develop into a definite walnut or even mahogany brown, quite irrespective of arsenical medication—it is part of its character to develop that pigmentation. This colour is very distinctive in Europeans; in negroes it is somewhat different, the papule being of a whitish colour. The papules may

a summary and a review of the very important discussions which took place at this the most recent congress on lichen planus. Those who are more particularly interested in the matter are referred to the reports of the transactions of that congress in the *Bulletin de la Société Française de Dermatologie et de Syphiligraphie* for July 1927; practically the whole of that number is devoted to the discussion which took place at Strassburg.

One of the most interesting new observations as to the causation of the disease which was dealt with at this meeting is the histological demonstration in the very early lesions of lichen planus—before the papular stage is, in fact, reached—of certain cells in great abundance of a special type, more particularly distributed in the neighbourhood of the sweat ducts, the so-called cells of Merkel-Ranvier, which are found in small numbers in the normal skin, but are much more numerous in lichen planus; and the presence in the adult papule of certain fibres which the writers, Professor Pautrier and Dr. Diss, have demonstrated to be nerve fibres in connection with the nerves of the skin. This remarkable observation appears to have been made possible by new methods of staining. The authors assume that the cells of Merkel-Ranvier by proliferation produce these nerve fibres. These observations, if confirmed, suggest a nervous etiology for lichen planus which has long been assumed upon clinical grounds.

Incidence.—I propose to give a short sketch of certain features which make the clinical recognition of lichen planus, I think, much more easy than that of many skin diseases. I have collected a large number of personal cases—something like three hundred—and of those cases a very considerable majority were in females, an observation which has been made by others. It is probable that the ratio which I found

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in circinate patches, as happens in lichen spinulosus. The acuminate type may sometimes be found mixed with flat papules, or the lesions may consist wholly of the acuminate type. In this case there is great difficulty in distinguishing the eruption from another disease—pityriasis rubra pilaris. There is still a third type of lesion, very rare, but well established. This is a white papule in Europeans constituting the so-called lichen sclerosus.

Distribution.—The eruption commonly begins on the inner surface of the knees, the backs of the wrists, the nape of the neck. Lichen planus is one of the diseases in which the incidence follows upon injury or friction. The sites of injury, scratches, etc., are often picked out by papules, and it is quite often a help in diagnosis to find a scratch mark studded with fresh papules of the disease. It is extremely uncommon upon the face, or upon the scalp, and perhaps a little less uncommon upon the hands and feet. In very rare instances, as I have said, the whole body may be affected, usually in the acute variety. The mucous membranes are affected in a considerable proportion of cases—in probably at least 25 per cent. The commonest of the mucous membranes to be affected is the buccal mucosa. The vulva is much more often involved than is perhaps recognized, probably because it is seldom looked for. The glans penis is not uncommonly found to be the earliest site of the disease. The annular variety particularly affects the penis, and may be mistaken for syphilis. The conjunctivæ are very seldom implicated. There is no very typical disorder of the nail in association with lichen planus; there is sometimes pitting or fluting, but this is not at all distinctive.

Varieties.—Besides the commoner varieties of eruption which I have just mentioned, there are certain conditions which are regarded as clinical varieties of

coalesce and form sheets of inflammation that disguise the initial character; maceration may bring out the individual papules even in old patches. Lichen planus is one of the diseases which may attack the mucous membranes, and upon these the papule is of a whitish colour. This occurrence of lesions on mucous membranes is one of the important means of diagnosing lichen planus from other conditions, especially from psoriasis.

The size of the lesion is surprisingly constant, being from 1-5 μ . Lichen planus is one of the most homogeneous of diseases of the skin; it keeps its type almost throughout its development; it presents practically nothing else but the papule from start to finish. Sometimes you may find bullæ, but these are extremely rare. The shape is another highly characteristic feature. It is determined by the natural lines of the skin, such as may be seen on the back of the hand, enclosing quadrangular areas, and the papule is bounded by those lines. In this respect it is distinctive from the lesions of syphilis and psoriasis, which tend to be circular. The surface is another of its striking characteristics: in the early papules there is a typical mother-of-pearl lustre. This appearance is sometimes imitated in urticarial conditions in children, the so-called lichen infantum, which was at one time regarded as being a lichen planus in children and which may deceive very experienced observers. In larger and older lesions a certain change takes place by which grey lines are to be seen upon the surface, the so-called striæ of Wickham, of Paris, who first described this condition.

Besides the plane papule, which is the common characteristic type, there is also the acuminate papule. This differs very considerably in appearance from the plane. It is a hard, coniform, follicular elevation, with a central plug, which can be shelled out leaving a slight umbilication. These papules are not, as a rule, grouped

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lichen planus, and amongst the most interesting of these is linear lichen planus. This occurs with very remarkable frequency in children as compared with the other varieties of lichen planus, and the curious relative frequency of that type of eruption in children makes it a little doubtful whether it is true lichen planus. As a rule, this type occurs as long lines, made up of characteristic papules, spreading sometimes from the buttock to the heel, more common upon the lower extremities, but occurring also upon the upper parts of the body. It is usually asymmetrical, following "Head's areas" of innervation, and is, as a rule, extremely resistant to treatment. The second variety of these rare types which I shall mention is annular lichen planus, in which from the beginning the papules form circles more or less large in size, which may become interseeted, and describe intricate patterns.

Again, a variety which has commonly been regarded as being a type of lichen planus is lichen hypertrophicus or verrucosus, in which hard, warty growths are found. This has recently been attacked, especially by the French school, as not being a true lichen planus, and this question was discussed at the recent congress at Strassburg, several French authors maintaining it was not essentially a lichen planus, but more probably a type of lichenification which may occur in a variety of chronic diseases, not necessarily only in lichen planus.

Certain other eruptions with resemblances to lichen planus must also be discussed. Lichen spinulosus, found almost exclusively in young people, very seldom in adults, occurs as grouped acuminate lesions, rather like lichen acuminatus. It has sometimes been observed in association with the flat papules of lichen planus, and in some cases persons with lichen spinulosus in childhood have later developed lichen planus. The theory has been suggested that lichen spinulosus is a lichen of children. I am in complete disagreement

with this view, because I do not consider that the histology of lichen spinulosus is in any way similar to that of lichen planus. A much commoner condition, very common in certain countries, is the lichen simplex chronicus of Vidal. The lesions are circumscribed, slightly scaly, usually shiny sheets of inflammation sharply circumscribed and small in area, usually extremely itchy. It occurs mostly in adult or elderly women, about the climacteric, the nape of the neck and the labia being frequent sites. Its relations to lichen planus are very disputed; it is, I think, difficult to accept as being necessarily a variety. Another interesting discussion is to be found in the journal to which I have referred, i.e. the classification of the disease known as lichen nitidus, an eruption which has been regarded for some time as a tuberculide, and was so regarded by the first person to make the distinction—Pinkus. Others, notably Barber, describe it as a disease *sui generis*. The congress at Strassburg seems to identify it with lichen planus. The papules are very faintly pink, very small, generally distributed about the genitals. It is mild in type, often not remarked by the patient because of its mildness. Lichen planus atrophicus is still another very rare variety, of which I had a case a few days ago. The eruption consists of shiny white atrophic spots, with, in some cases, linear lesions of the same type. It may be very difficult to distinguish this variety from scleroderma.

Behaviour.—The behaviour of lichen planus is remarkably variable, some eruptions disappearing rapidly in response to treatment, others lasting for weeks or months. It is not so likely to recur as psoriasis, but on the whole it has a tendency towards recurrence at long intervals. In the hypertrophic type, so commonly found on the lower extremities, one may get masses of warty growth, which are a little like malign-

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woman who had lost a child four days previously. It is agreed that the nervous condition of the patient exerts an important share in the disease. Certain observers have regarded it as being due to toxic absorptions and septic foci, and there is obviously a field for speculation here; and, at any rate, it is important to search for and eliminate septic foci. Direct bacterial infection is improbable; no organisms have been found as causing the condition. Professor Pautrier, as described in this article, has made some recent experiments by inoculating fragments of affected skin into healthy persons without any result at all in some fifteen or sixteen experiments.

One curious fact is established from a study of statistics. In 1919 I prepared a collection of my own cases and compared them with a much smaller number of cases in Crocker's list, published in 1893. Crocker's series gave a proportion of cases of lichen planus of about 1 per thousand, and in my series it was a proportion of about 0·5 per thousand. I wrote round to several heads of departments and found unexpected confirmation of my ratio. So that the conclusion is irresistible that lichen planus is only half as frequent now as in 1893, when Crocker's list was compiled.

TREATMENT.

I shall detail in the first place my personal preferences for the treatment of lichen planus, founded upon my own experience. I have long been impressed with the value of disintoxication of the intestinal canal in cases of lichen planus, and especially of the acute variety. The most rapid and satisfactory method of at least a temporary disintoxication is by the application of the method of Guelpa, which has been so widely used in diabetes, not always with due acknowledgment to its inventor. The procedure is that the patient takes an ounce to an ounce and a-half of Glauber's salts,

nant growths, but which never are malignant. I have seen some very remarkable instances. The treatment of this type is rather special; it is very resistant to treatment; X-rays are useless. In my own experience, the best treatment has been to shave the areas as closely as possible without causing the patient pain, and then to freeze the remainder of the mass several times until complete involution of the lesion takes place. In connection with the possible theories of the causation of lichen planus, it is interesting to note that it is most uncommon to get a family history. This question came up for discussion some time ago at the Dermatological Section, where two sisters were shown who had this condition simultaneously. At the meeting there were present a large number of heads of departments, and they were unable to find more than about three instances of members of the same family being simultaneously affected. This observation is against theories which assume an infective cause for lichen planus.

Causation.—I propose now to discuss certain theories of the causation of lichen planus. As I have said, the new observation described at the Strassburg congress rather strongly fortifies a view which is sometimes called by Continental writers “the English view” of the part played by nervous disease and nervous shock in the production of lichen planus. This was a view strongly held by Collott Fox, a remarkable observer in the field of dermatology. One gets very numerous instances of shock preceding eruptions, and especially acute eruptions.

I had one very remarkable case of the linear variety, an eruption extending from buttock to heel. The history was extraordinary. This acute eruption came in six weeks, and in the eighteen months prior to its appearance the patient had lost three brothers, his sister, his father, his wife and his only child. In addition to this he had the burden of providing for those left, and he was absolutely worn out when he saw me.

I have seen it come out like an acute eruption in a

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woman who had lost a child four days previously. It is agreed that the nervous condition of the patient exerts an important share in the disease. Certain observers have regarded it as being due to toxie absorptions and septic foci, and there is obviously a field for speculation here; and, at any rate, it is important to search for and eliminate septic foci. Direct bacterial infection is improbable; no organisms have been found as causing the condition. Professor Pautrier, as described in this article, has made some recent experiments by inoculating fragments of affected skin into healthy persons without any result at all in some fifteen or sixteen experiments.

One curious fact is established from a study of statistics. In 1919 I prepared a collection of my own cases and compared them with a much smaller number of cases in Crocker's list, published in 1893. Crocker's series gave a proportion of cases of lichen planus of about 1 per thousand, and in my series it was a proportion of about 0.5 per thousand. I wrote round to several heads of departments and found unexpected confirmation of my ratio. So that the conclusion is irresistible that lichen planus is only half as frequent now as in 1893, when Crocker's list was compiled.

TREATMENT.

I shall detail in the first place my personal preferences for the treatment of lichen planus, founded upon my own experience. I have long been impressed with the value of disintoxication of the intestinal canal in cases of lichen planus, and especially of the acute variety. The most rapid and satisfactory method of at least a temporary disintoxication is by the application of the method of Guelpa, which has been so widely used in diabetes, not always with due acknowledgment to its inventor. The procedure is that the patient takes an ounce to an ounce and a-half of Glauber's salts,

dissolved in a pint of hot water, upon the morning set apart for treatment. During the rest of the morning, fluid, which is not foodstuff, should be taken in as large quantity as the patient can manage: for example, plain water, orange juice, lemonade or tea without milk. No food whatsoever is to be taken during this day. The next morning the ordinary diet may be resumed. I have seen in many instances acute and extensive eruptions of lichen planus fade as if by magic after a few applications of this method.

By the same principle obvious foci of sepsis should, of course, be dealt with, and possibilities of sepsis from teeth, tonsils and intestines must be carefully considered.

Lichen planus is a very depressing disease in most cases, and in some a frenzy of itching bordering upon mania may develop, especially in acute cases. Such patients should be kept in bed, which is an important part of the treatment. Some psychological insight is required to deal adequately with patients suffering from lichen planus. Often domestic worries will be insistent and reacted to in a surprisingly disproportionate fashion. I have seen a lady, obsessed, like Martha, with household cares, suffer from an acute attack of lichen planus as the result of the departure of a housemaid. In another case an elderly man, who had married a young wife and was somewhat overwhelmed by her social activities, begged me to take him into a nursing home to escape from them, and began to improve only when separated from his household.

I have not been greatly impressed with the value of local applications in extensive or acute cases. I place much more reliance upon what may be described as internal measures. In chronic cases chrysarobin ointment is sometimes nearly as useful as it is in psoriasis. Local application of X-rays has, as a rule, been some-

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what disappointing. The best internal remedy in my experience is the intramuscular injection of mercury salicyl arsenate, sold under the name of enesol. I have used this extensively and with complete satisfaction in every kind of case. Arsenic given in the metallic form is not nearly so effective, and there was a general consensus of opinion at Strassburg that this form of medication should be dropped.

The use of intravenous injections of N.A.B. has been warmly advocated by many writers, and was recommended in the discussion at Strassburg. A very odd circumstance has come to light with the increased use of N.A.B., both in syphilis and in other diseases. It has, I think, been demonstrated without doubt that lichen planus may actually be precipitated, if not produced, by injections of N.A.B., and we have had some cases shown at the Dermatological Section in London of incidents of this type.

Lumbar puncture, initiated by Ravant, has been recommended as a measure of relief of itching, but the relief is only temporary, and the eruption does not in any way seem to respond to treatment of this kind. This treatment was referred to and condemned by the meeting at Strassburg.

The French school, as a corollary of the histological finding of local proliferation of nerve tissues as a factor in this disease, has used very extensively radiotherapy, both of the cord and of the sympathetic system. The itching is said to stop almost immediately and the eruption to disappear very rapidly. The technique, dosage and conclusions from treatment may be noted in full in the report I mentioned in the beginning of this article. English writers do not seem as yet to have applied this method to any extent, but our French colleagues are enthusiastic as to its success. Doubtless it will be tried out in this country, and we shall await with interest reports upon its results.

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taining nuclei and tending to stick together as visible scales or flakes. If by pressure on the surface of the skin you forcibly prevent the increase of tissue from causing a projection on the surface, as it has to go somewhere it projects inwards and depresses the corium. Varying degrees and combinations of these secondary features account for the different varieties of warts.

The typical *plane or juvenile warts* common on the hands and faces of children are the simplest type of wart, and the type from which the other forms can be regarded as being derived by accentuation of one or another character. These plane warts are small, smooth elevations two or three millimetres across and perhaps half a millimetre high, and are the colour of the normal skin. They often occur in great numbers on the hands and faces of children. When looked at with a lens the surface can sometimes be seen to be not truly uniform, but showing a slight degree of "raspberry" appearance. Structurally they consist of a moderate thickening of the prickle-cell and horny layers with a moderate and fairly regular lengthening of the papillæ caused by the downgrowth of the interpapillary processes.

The *common wart* is a development of the type of the plane wart, and is often found on the hands of children who have plane warts on their faces. Here the interpapillary pegs of the prickle-cell layer have become much more pronounced and often irregular, the papillæ being drawn out between them; and the individual papillæ are more distinguishable on the surface, each with its cap of horny layer. In the common wart there is a considerable degree of lengthening of the papillæ and a considerable degree of hyperkeratosis.

The *plantar wart* is similar to the common wart except that, owing to pressure (as it occurs on the sole

Warts and Their Treatment.

By A. C. ROXBURGH, M.D., M.R.C.P.

Physician in Charge of the Skin Department, St. Bartholomew's Hospital ; Physician, St. John's Hospital for Diseases of the Skin.

IN this article in *THE PRACTITIONER* I propose to deal principally with the common wart, "*verruca vulgaris*," and its varieties such as the plane, the filiform, the digitate, *condyloma acuminatum*, etc., and will refer only briefly to other warty conditions such as the keratoses produced by long exposure to sunlight, arsenic or tar, and the so-called post-mortem wart (*verruca necrogenica*). None of these latter has any relationship to the true wart.

The essential feature of all types of true wart is a localized hypertrophy of the prickle-cell layer of the epidermis leading to a great thickening of this layer. Normally, mitoses can be seen only in the deepest or basal layer, but in warts mitoses can be seen in the whole thickness of the prickle-cell layer, showing that the cells are going on multiplying owing to some abnormal stimulus. In addition to mitoses, various degenerative changes can be seen which will be referred to later on.

If the thickness of one layer of skin is greatly increased the added tissue has to go somewhere, and the usual result is that in addition to the formation of a projection on the surface the interpapillary processes are elongated and widened. A great increase in the prickle-cell layer, the so-called acanthosis, leads, usually, to some degree of hyperkeratosis—thickening of the horny layer, and usually also to some parakeratosis—imperfect formation of horn cells, the cells still con-

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they get inoculated with warts at the same time as with gonorrhœa? In the non-gonorrhœal cases *verruca vulgaris* sometimes preceded the condylomata.

There is some doubt whether the *senile* or so-called *seborrhœic wart* has or has not the same etiology as the types of wart I have already described. Kyrle⁵ classes it with the others, and I shall so regard it. This wart is a rather flat, brown elevation on the skin of the back, trunk or face of middle-aged or elderly individuals.

Hoffman³ has described two cases of what he considers to be *generalized verrucosis* of the scalp, and what are probably other cases of the same nature have been described by others.

With the possible exception of the senile or seborrhœic wart, all the above types of wart—plane common, filiform and condyloma acuminatum—are due to one and the same filter-passing virus. It is well known that warts are infectious and inoculable; and there is the popular belief that, if you make a wart bleed, wherever the blood goes the patient will get a fresh crop of warts. One often sees a line of warts on the face or hand of a child obviously following a scratch. Numerous investigators have worked at the etiology of warts, but I will mention only a few.

In 1919 Wile and Kingery¹² ground up material from ordinary warts and filtered it through a Berkefeld filter. The filtrate was tested for sterility on ordinary culture media. It was then injected with a syringe intradermically into several volunteers, including the authors; four weeks later small, flat, wart-like lesions appeared at the sites of inoculation. These increased slowly in size and took on more and more the characteristics of flat warts. In two cases the warts reached a large size and became rough and horny, like common warts. Histologically the lesions were indistinguishable from ordinary warts. They mostly remained for many

of the foot or heel), the lengthened interpapillary processes are forced inwards so as to invaginate the corium, and they become surrounded by a thickened ring of epidermis. The opening of the pocket containing the wart is narrower than the bottom of it as a rule. Owing to pressure on the nerve endings below, these plantar warts are very painful, just as corns are. They are often mistaken for corns. They occur chiefly under the ball of the great toe or under the pad of the toe itself and on the heel.

The *filiform wart* is found on the neck and chin, on the scalp, where it is often digitate, and on the genitals, where it takes the form known as *condyloma acuminatum*, and is often misnamed venereal or gonorrhœal wart. It is derived from the type of the plane wart by an enormous stretching of the papillæ, due to the very active growth of the cells of the prickle-cell layer, the horny layer being very thin. Apparently the warmth and moisture of the regions upon which condylomata acuminata flourish have something to do with their characteristic profuse vegetative growth. It is a complete misnomer to call them venereal or gonorrhœal warts, for, as Charles W. Cathcart of Edinburgh was one of the first to show, they have no necessary relation whatever with gonorrhœa or other venereal disease. When I was in part charge of the V.D. clinic at St. Bartholomew's Hospital in the year 1920 we had nineteen cases with warts on the genitals (twelve male and seven female). Gonococci were found only in seven out of the nineteen, which equals 36·8 per cent. K. Brandes¹ reported thirty-eight patients with condyloma acuminatum, of whom twenty-six had verruca vulgaris as well. More than half had no gonorrhœa. In the patients who had gonorrhœa the warts followed two to five months later. This interval is similar to the incubation period of experimental inoculation with verruca vulgaris. The question therefore arises, Did

they get inoculated with warts at the same time as with gonorrhœa? In the non-gonorrhœal cases *verruca vulgaris* sometimes preceded the condylomata.

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months, though some showed a tendency to disappear more quickly.

Kingery,⁴ in 1921, went farther and demonstrated the possibility of producing a second generation of warts by inoculating a filtrate of warts originally produced by inoculation. The incubation period of the second generation was about six months. With so long an incubation period it is a little difficult to rule out coincidence, but probably the warts really were the result of the inoculation.

Waelsh,¹⁰ in 1914, produced a common wart on the vulva following inoculation with material from a condyloma acuminatum, and warts on the skin and mucous membrane of a dog following inoculation with material from a laryngeal papilloma.

A. Serra⁸ also has shown that material from verruca vulgaris can reproduce the disease by inoculation even though filtered through a Berkefeld filter. In 1924 he showed that the virus of condyloma acuminatum could pass through a Chamberland filter and by inoculation produce verruca vulgaris.

There is little doubt that the primary change is in the Malpighian layer, and that warts are an example of an "epitheliosis" due to a filter-passing organism. In the majority of epithelioses due to filter-passers there are characteristic changes visible in the cells of the prickle-cell layer. These are a swelling of the nucleus, with vacuole formation in the protoplasm of the cell. Bodies which stain with eosin are found in the nuclei and in the cell protoplasm; these bodies are what are called "cell inclusions" or "einschlüssen," and were supposed by Prowaczek to represent the virus with a covering derived from the cell protoplasm. He therefore termed this group of organisms "Chlamydozoa," meaning "germs with overcoats," and the diseases in which they are found "Einschlüsskrankheiten." These inclusions are found in variola, where

they were described first by Guarneri and so are called Guarneri-bodies. They are found also in varicella, herpes febrilis, herpes zoster, molluscum contagiosum and warts.

It has been shown, however, by Kyrle⁶ that these "inclusions" are really the nucleoli of the nucleus which undergo some change causing them to take on an eosinophil character, and that they are then extruded from the nucleus and lie in the cytoplasm. If Kyrle's view is correct these "cell inclusions" should rather be regarded as "nuclear exclusions." In order to find them in warts it is better to take young specimens. A very interesting point is that Kyrle⁶ has described and pictured similar nucleolar changes in very young lesions of psoriasis, e.g. four days old. Such lesions of small and ascertainable age are produced by scratching a patient in the eruptive stage of his first attack of psoriasis. The scratch is soon followed by a line of young psoriasis papules, this being known as Köbner's sign.

It is possible that *liehen planus* also is one of these epithelioses. It is clear that, as in many other diseases, some condition of the host or patient is required as well as the mere presence of a virus, before the characteristic lesion can be produced; e.g. a certain irritant will produce a dermatitis in "A" but not in "B," but if "B" is exposed sufficiently long to the action of the irritant a time may come when he will succumb to it. So possibly in warts. They are much commoner in children than in adults; they have a habit of appearing and disappearing sometimes with remarkable suddenness, which is no doubt the basis of the claims made for "charming away" warts. The following story shows how easily such a claim might receive apparent support:

A surgeon had a number of warts which he had arranged to have removed by a dermatologist. However, as he was going for a

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WARTS

This is allowed to soak in and then another drop may be applied, according to the size of the wart. Be careful not to use too much. In four to seven days cut away with a sharp scalpel all the yellow dead tissue, but stop short of causing bleeding; reapply the acid as before. Proceed in this way until the wart has entirely gone. Trichloroacetic acid and acid nitrate of mercury may be used in the same sort of way. The advantage of nitric acid over CO_2 snow for warts on the hands is that no blister is formed, and no raw area is left, but, on the other hand, it may produce more scar.

CO_2 snow: The advantages of this are that one application may cure a wart and little scar is left, but the drawbacks are that the patient may have a blister for a few days and may knock it off and be left with a small raw area which, in the case, for example, of doctors and nurses, is a disadvantage. If the degree of freezing has been exactly right the wart will drop off in about two weeks without any visible blister being formed. On the other hand, if the freezing has been insufficient nothing will happen at all. If the wart has a hard horny surface soften it first with liquor potassæ, applied with a match, for ten minutes, and then take a stick of CO_2 snow, compressed as hard as possible, and shaped so as exactly to fit the wart and not overlap it at any point. Then apply the pencil of snow with firm pressure until a ring of frozen tissue appears all round the wart. If this ring has not been in contact with the snow its appearance indicates that the wart has been frozen right through, and is a better guide than timing the application. Usually this takes one to two minutes.

Burning off the warts with the galvano-cautery under novocaine is the quickest way to remove a crop of warts, and obviates the bleeding which is associated with curetting. I think this point is of some importance as reducing the risk of fresh inoculation. As much of

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holiday, he changed his mind and decided to have the warts "charmed away" by an old woman he knew of in Wales.

On his return to town his warts were seen to have disappeared, so the dermatologist asked whether they had been charmed away.

The surgeon said no, that they had disappeared spontaneously before he went to see the old woman! Now had they only waited until the "charm" had been applied, what a splendid advertisement of the efficacy of the charm this would have been!

This leads on to the question of treatment by general measures rather than local. Half a pint of freshly-made lime water per day for two or three weeks is often said to be followed by the disappearance of warts. In my own experience this measure is completely valueless. Magnesium sulphate in such quantities as will produce two or three liquid stools per day for three weeks is said to have a similar effect. Most people, however, would prefer to have the warts. C. J. White¹¹ and Howard Fox² maintain that pills of $\frac{1}{4}$ grain protoiodide of mercury thrice daily will cause disappearance of warts, if taken for two months. I have tried this in several cases; in all of them, however, a mercurial stomatitis developed before the warts had gone, although I do think that in one case the warts were beginning to disappear. Other general measures from which successful results have been reported are the injection of N.A.B. (two doses of 0.6 gm.) by Lindsay⁷, and sulfarsenol (one intramuscular injection of 0.4 gm.) in six cases of plane warts by Sutton.⁹ I have tried several doses of sulfarsenol in two cases without the least success. General measures being therefore very uncertain, we have to rely in nearly all cases upon local treatment. I will take the different types of wart in succession and give for each the treatments that I personally have found most reliable.

Common warts.—Chemical caustics: Nitric acid. This should be applied by the medical man and not left to the patient. It is a good plan to protect the surrounding skin with vaseline and then to apply a drop of the caustic to the whole surface of the wart.

This is allowed to soak in and then another drop may be applied, according to the size of the wart. Be careful not to use too much. In four to seven days cut away with a sharp scalpel all the yellow dead tissue, but stop short of causing bleeding; reapply the acid as before. Proceed in this way until the wart has entirely gone. Trichloroacetic acid and acid nitrate of mercury may be used in the same sort of way. The advantage of nitric acid over CO_2 snow for warts on the hands is that no blister is formed, and no raw area is left, but, on the other hand, it may produce more scar.

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the burnt tissue as possible should be scraped away, short of causing bleeding.

Another rapid method is by electrolysis or zinc ionization. The needle (if of steel, negative, and if of zinc, positive) is used to transfix the base of the wart in several directions so as thoroughly to thrombose the vessels. The wart is then cut off cleanly with a sharp scalpel. A current of two milliamperes is used, and novocaine is not essential, although its use allows one to use rather more current.

In cases with a large number of common warts—on the back of the hand, for example—a pastille dose of X-rays unfiltered, to the whole area, often causes the warts to disappear. If one dose is insufficient it may be repeated once in four or five weeks. Common warts at the edge of the finger-nails are sometimes very troublesome to get rid of. The best treatment is probably by radium or X-rays; of the latter I usually give two pastille doses, unfiltered, in one sitting, through a hole in a piece of lead foil, which is cut exactly to fit the wart. The lead foil should have some adhesive strapping on its deep surface to cut off the secondary rays given off by the lead under the influence of the X-rays.

Plane warts.—If few in number these may be touched by the patient daily with glacial acetic acid. They are usually too small and too numerous to make CO_2 snow practicable. They may be painted every day or two with salicylic acid 12 per cent. in collodion, the collodion film being washed and rubbed off before each new application. A patient with plane warts on the shaved area of the face should apply a hydrarg. perchlor. lotion, 1 in 2,000, after every shave for some months to prevent recurrence. The galvano-cautery at a very dull red heat may be used lightly without novocaine in some patients with plane warts, with good results. But there is little doubt that by far the most satisfactory treat-

ment for a crop of plane warts is by X-rays; three-quarters to one pastille dose, unfiltered, is given to the most thickly infested areas, and very likely the less affected areas will then clear up without treatment, owing presumably to some antibody being formed as a result of the absorption of those warts actually exposed to the X-rays. This dose may be repeated, if necessary, in a month or five weeks.

Filiform warts.—These are best treated by transfixion of the base by an electrolysis needle to thrombose the vessels, the wart being then simply cut off, as in the case of common warts already described. Novocaine and cautery or zinc ionization can also be used.

Digitate warts.—These are common on the scalp and can be treated in the same way as filiform warts or very successfully dealt with by applying about one drop of strong nitric acid to each. Do not use too much or at the patient's next visit you will be surprised to find a hole of unpleasant depth in the scalp. These warts have a great capacity for absorbing nitric acid. Glacial acetic acid is safer, but not so rapid.

Condylomata acuminata.—These are best dealt with by cutting them off with a galvano-cautery under an anæsthetic, which may be local or general, according to the size and situation of the warts. The sites should be kept clean and dusted with, say, acid salicylic 1 part, talc powder 3 parts, until healed. Small condylomata acuminata can be quite successfully dealt with by rubbing with the solid silver nitrate stick, and they are in my opinion about the only kind of wart which can be treated successfully with silver nitrate.

Plantar warts.—As I have already said, these are only common warts which, owing to the pressure against which they grow, have become invaginated into the sole of the foot. There are two successful methods of treatment, and in my experience only two. The

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the burnt tissue as possible should be scraped away, short of causing bleeding.

Another rapid method is by electrolysis or zinc ionization. The needle (if of steel, negative, and if of zinc, positive) is used to transfix the base of the wart in several directions so as thoroughly to thrombose the vessels. The wart is then cut off cleanly with a sharp scalpel. A current of two milliamperes is used, and novocaine is not essential, although its use allows one to use rather more current.

In cases with a large number of common warts—on the back of the hand, for example—a pastille dose of X-rays unfiltered, to the whole area, often causes the warts to disappear. If one dose is insufficient it may be repeated once in four or five weeks. Common warts at the edge of the finger-nails are sometimes very troublesome to get rid of. The best treatment is probably by radium or X-rays; of the latter I usually give two pastille doses, unfiltered, in one sitting, through a hole in a piece of lead foil, which is cut exactly to fit the wart. The lead foil should have some adhesive strapping on its deep surface to cut off the secondary rays given off by the lead under the influence of the X-rays.

Plane warts.—If few in number these may be touched by the patient daily with glacial acetic acid. They are usually too small and too numerous to make CO₂ snow practicable. They may be painted every day or two with salicylic acid 12 per cent. in collodion, the collodion film being washed and rubbed off before each new application. A patient with plane warts on the shaved area of the face should apply a hydrarg. perchlor. lotion, 1 in 2,000, after every shave for some months to prevent recurrence. The galvano-cautery at a very dull red heat may be used lightly without novocaine in some patients with plane warts, with good results. But there is little doubt that by far the most satisfactory treat-

so that there is no chance of the healthy skin getting the heavy dose intended for the wart only. After the X-rays the patient should wear a thick piece of felt, adhesive on one side, with a hole cut in it, to relieve pressure on the wart, on the lines of the common corn plaster. Usually within three to four days all pain ceases and the patient forgets about the wart. In a month or six weeks it may be pared or scraped and will often be found to be entirely removable without any pain or bleeding. It often happens, however, that one dose of X-rays, even of three pastilles, is not enough and further doses must be given. This is no doubt due to the filtering off of the rays through the horny superficial layers of the wart.

The X-ray treatment of plantar warts is certainly the method which gives least trouble to the patient, but its results are not so rapid or so certain as removal by scraping in the manner I have described. Radium if available can be used instead of X-rays.

“*Seborrhæic*” or “*senile*” warts.—These rough brown or black elevations are easily removed by freezing with CO₂ snow, or by painting with pure carbolic acid, once or twice, as may be required.

I shall now refer briefly to some other warty conditions which are not related to the true warts so far as we know.

The so-called *post-mortem wart* (*verruca necrogenica*) is due to direct implantation of the tubercle bacillus in the skin by accidental prick or injury. It consists of tubercles, with giant cells and tubercle bacilli, in the deeper layers of the skin with, sometimes, miliary abscesses. There is an infiltration of small round cells beneath the epidermis and some dilation of blood vessels. There is also a secondary hypertrophy of the prickle-cell and horny layers leading to a warty appearance. The best treatment is excision or destruction by cautery, if small and acute. If chronic or large, X-rays, radium,

quickest is to scrape out the wart ruthlessly with a Vollmann's spoon under a general or local anæsthetic. After some pretty vigorous work with the spoon you will find that the wart shells out nicely, leaving a smooth walled cavity whose size and depth will probably surprise you. The mouth of the cavity may be a good deal narrower than the deeper part, and the thick epidermis forming its walls must now be clipped off with curved seissors until it slopes gently away from the deepest part of the cavity. The wound is then mopped with silver nitrate solution 15 grs. to the ounce, or with tincture of iodine, and dressed with gauze soaked in tincture of iodine. After a couple of days the original dressing is removed and the wound dry dressed till healed. There is little or no pain after this operation, and although some patients prefer to rest the foot for a few days all do not do so. Occasionally as the hole heals up a small horny plug is found in the centre. This is quite superficial, and should be removed by paring once or twice just as though it were a corn. I have never seen a painful cicatrix follow this method of treatment.

The only other successful method of dealing with plantar warts that I know is by means of X-rays. These should be applied as follows. The wart is pared with a sharp scalpel as far as possible, short of pain and bleeding. This is mainly to get an idea of the real area of the wart which is usually much larger than appears from the surface. A hole is now cut in a piece of stout lead foil corresponding in size and shape with the estimated real size of the wart. The foil is backed with strapping and then secured firmly to the skin with more strapping so that the wart appears exactly in the hole cut for it. Two or three pastille doses of unfiltered X-rays are then given, at one sitting, to the wart, using a lead glass applicator whose opening must be smaller than the area of the lead foil,

Familial Infection of Chronic Sinusitis: Its Clinical Import.

By PATRICK WATSON-WILLIAMS, M.D.

*Consulting Surgeon to the Ear, Nose and Throat Department,
Bristol Royal Infirmary, etc.*

THE communicability of chronic nasal catarrh is obviously a matter of practical importance. Although it would seem inevitable that, if only in a less degree, chronic as well as acute catarrh should be contagious, yet this is not an easy question to prove in practice. When confronted with fibrinous rhinitis, due to a distinctive organism such as the Klebs-Loeffler bacillus, the question of contagion is readily proved, but, so ubiquitous is the common cold, we take refuge in the belief that while certain families tend to escape, others have an inborn predisposition to catarrhal infections. In a measure this seems true beyond dispute, nevertheless there is a difference between proclivity to common colds which come and go completely, and a chronic catarrh when it becomes an established or "focal infection." Now if, as there is good reason to suppose, chronic nasal focal sepsis is a causal factor in appendicitis and gastro-intestinal catarrh, etc., we ought to find that such abdominal sub-infections tend to prevail in families exhibiting a proclivity to chronic naso-oral sepsis. Of course, similar evidences of a tendency to sub-infections in other territories should appear, but we shall restrict our investigations to the abdominal region, except for one example in which mastoiditis and insanity seem to have resulted from familial infection.

Reasons for the view that nasal sepsis is a causal

Finsen light or selective caustics such as pyrogallie acid, locally, together with general carbon arc light baths.

The *keratoses* on the face and hands seen in elderly people, especially in those who have been exposed for many years to strong sunshine, and which form part of the picture known as "sailor's skin" or "senile skin," can be removed by the galvano-cautery, curetting or by CO₂ snow. If any of them show a tendency to rapid growth it is probably better to excise such completely, in case they should be developing into epitheliomata. The same applies to the warty growths which occur in chronic X-ray dermatitis and to the keratoses seen in men who have worked for many years with tar, or crude mineral oils, or who have taken arsenic over long periods, for example for psoriasis. Radium also may be used for the treatment of the above types of keratoses, even for those in chronic X-ray dermatitis.

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- ¹¹ White, C. J. (*Jour. Cut. Dis.*, 1915, p. 738; 1916, p. 361).
- ¹² Wile and Kingery (*Jour. Amer. Med. Assoc.*, 1919, vol. 73, p. 970).

CHRONIC SINUSITIS

TABLE A—continued.
(Year 1916.)

<p>K., son age 15 (1916) 1905 Age 4 Opn. Adcnoids.</p> <p>11 Opn. on nose. ? Ethmoids for ch. rhinitis.</p> <p>13 Pleurisy and pneumonia.</p> <p>1916 Age 15 Referred for chronic rhinitis. Mental depres- sion, unable to concentrate. Opn. both an- tra, both sphen- oidal sinuses and R. sphenoi- dal sinus, pus in all. Staph. aureus in all and strep- tococcus in sphenoids.</p>	<p>Daughter healthy.</p>	<p>M., son age 11 (1916) Age 4 Chronic rhin- itis. Opn. Tonsils and adenoids.</p> <p>14 Ch. rhinitis headaches, puffy eyes, renal discasc.</p> <p>14½ Acute ap- pendicitis. Appendicce- tomy.</p>	<p>Daughter age 6 (1916) 1903 Age 3 Opn. Tonsils and adcnoids.</p> <p>9 Was referred to W.W. Had severe head- aches every two weeks. Chronic rhin- itis.</p> <p>9½ Opn. Tonsils enucleated. Streptococcus and staphylo- coccus in eth- moid cells. Antra and sphenoidals sterile.</p>
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From the dates of incidence of symptoms it would appear that the father infected the three children and that the mother probably became infected in turn from her own children.

In this connection I quote from my Semon Lecture (1925) the following remarkable instructive examples illustrating "the infectivity of chronic nasal sepsis, and, furthermore, its causal relationship to appendicitis where a parent may act as a carrier infecting the children":—

TABLE B.

Father, aged 58. Catarrhal otitis for thirty years. Chronic sinusitis (operation fifteen years ago and still infective three years ago).

Five sons

<p>Aged 30 No history of sepsis or nasal sepsis</p> <p>Appendicce- tomy. (War service)</p>	<p>Aged 28 Asthma Sinusitis (operation)</p> <p>Appendicce- tomy.</p>	<p>Aged 26 Asthma Sinusitis (operation)</p> <p>Appendicce- tomy.</p>	<p>Aged 20 Chronic rhin- itis Tonsils and adenoids (operation) Appendicce- tomy.</p>	<p>Aged 16 Asthma Sinusitis.</p>
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It may be interesting to my readers for me

factor in the occurrence of appendicitis and other gastrointestinal infections were set forth in *THE PRACTITIONER*¹ for April 1921, with an analysis of 90 consecutive cases of definite infective nasal sinusitis in my private practice during two years. One found that no fewer than 14 of the 90 patients had undergone appendicectomy; that is over 15·5 per cent. Moreover, of these 14 cases two had also undergone operation for gastro-duodenal ulcers, and two others who had escaped appendicectomy had had gastric ulcer; hence of the 90, almost 19 per cent. had had operations for one or the other. The pathways of infection from infected sinuses to the gastric mucosa² were described and illustrated in my recent article, which included further examples of appendicitis, etc., due to sinus infection.

I suggest that a child, when the subject of a nasal sinus focal infection, rarely escapes septic infection of its tonsils and adenoids, and that when these have alone been removed the persistent re-infection of the remaining lymphoid tissue causes recurrence of adenoids, perhaps once or twice. This child will tend to infect brothers and sisters; it gets the credit of starting the family colds, although auto-immunization may in time confer a relative immunity on the offender. But if that child grows up and marries, this carrier parent is prone to infect members of his family, and in some cases my investigation of such an unsuspected source of infection in children has revealed the fact that a parent has been subject of a long-standing nasal sinus infection. What has been accepted as inborn familial constitutional weakness may perhaps be more correctly explained as "carrier infectivity." The following examples may be of interest:—

TABLE A.

<p>Father. Subject of chronic rhinitis of many years' standing. Probably auto-immunized. (dead).</p>	<p>Mother. In 1916, headaches and megrim for 12 years. Chronic rhinitis. 1919. Chronic rhinitis. Pharyngitis. Ch. rheumatism. 1924. Cholecystectomy.</p>
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CHRONIC SINUSITIS

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to publish again the following example³ summarized in Table C:

The father, aged fifty-nine, had had a stuffy nose as long as he could remember. There was a marked deflection of the septum to the left, causing almost complete occlusion of the left nasal passage. Endo-rhinosecopy showed a stream of muco-pus in his left middle meatus and muco-pus on the posterior end of the right inferior turbinal. Certainly the left maxillary antrum was the source of pus on the left side. No operation or culture was done. He had married late in life and had no occupation, and was devoted to the boys, who were constantly with him, having no other children.

One son, W., aged thirteen and a-half, with adenoids facies and buccal respiration, had been developing asthma for ten months and was very prone to colds and post-nasal catarrh; he was in poor health and suspected of latent tuberculosis by his family medical attendant. He had appendicectomy at the age of five; it was of the acute suppurative type. On examination there were no enlarged tonsils. Exploration by the suction syringe yielded the following results on cultures by Professor Walker Hall: right antrum, *staphylococcus albus*; left antrum, *staphylococcus albus*; right sphenoidal sinus, film, polynuclears, a few cocci; left sphenoidal sinus, culture, no polynuclears, no cocci. An operation was performed on both maxillary antra, and the right sphenoidal sinus was opened and drained.

The other son, H., aged eleven, had frequent attacks of sneezing and was liable to recurrent colds; he was anæmic, the glands of the neck were enlarged, the chest retracted, and he had buccal respiration. He had had tonsils and adenoids removed at the age of three; at age of six had appendicectomy; at age of nine and a-half had another operation for adenoids. The mother reported that his nasal stuffiness was no better. On examination, the fauces were normal. Exploration of this boy's nasal sinuses by the suction syringe showed polynuclears, and excess of mucus and *staphylococcus albus* on culture. An operation was performed, and both sphenoidal sinuses and both maxillary antra were opened and drained.

TABLE C.

Father, aged 59. Chronic nasal catarrh and sinusitis of many years' duration.

Two sons

W.	H.
Rhinitis (early childhood)	Age 3 (Operation) Tonsils and adenoids
Asthma	Age 6 Appendicectomy
Age 5 Appendicectomy	Age 9 (Second operation) Tonsils and adenoids
Age 18 Chronic sinusitis (operation)	Age 11 Chronic sinusitis (operation)

Other hitherto unpublished examples may be cited.

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TABLE D.

Father (died cancer). Mother (many years headaches. L. nasal discharge. Cacostmia).

Son. Nil	Son. Appendic ^y	Son. Appendic ^y	Son. Appendic ^y	Miss A., age 30. Septic tonsils and pyorrhœa many years. Sinusitis 1924. Appendic ^y , age 23.
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TABLE E.

Father (chronic rheumatoid arthritis).

Girl. Nil	Girl. Appendic ^y	Girl. Appendic ^y	Son. Nil.	Girl. Appendic ^y	Son. Chronic cat. deafness. Opn. Tonsils and adenoids.
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TABLE F.

Father. Bronchitic from early childhood, constant nasal catarrh. Explored: antra healthy, sphenoidal and post-ethmoidal sinuses mucopus; polymorphs and phagocytosis of streptococci in all.

Son, aged 5½. Septal deflection. Purulent rhinitis of two years' duration 1½ years previously tonsils and adenoids operation (before I saw him) without relief.	Antra clear but sphenoidal sinuses and post-ethmoidal cells mucopus with streptococci and staphylococci "crystals" showing chronicity of sinusitis.	Sphenoidal sinuses opened.
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Appendic^y 4½ months later. Poliomyelitis after further 3 months. One sister and brother—no naso-oral sepsis.

TABLE G.

Chronic rhinitis and cough, etc., several years' duration.	Adenoids Sinuses. R. antrum, post-ethmoid cells and sphenoid sinus: polymorphonuclears and all <i>B. Coli</i> pure, other sinuses sterile.	Operation Adenoids removed. Infected sinuses opened pernasally Ant. turbinectomy Middle turbinectomy R. and L.
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Five years previously was ill, thin and poor health. She had *B. Coli* cystitis; from about that time her chronic nasal catarrh appeared.

Her mother (widow): One and a-half years previously after pro-

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Other hitherto unpublished examples may be cited.

Criminal Abortion.

By L. A. PARRY, M.D., B.S., F.R.C.S.

*Consulting Surgeon, Royal Alexandra Hospital for Sick Children,
Brixton, etc.*

CRIMINAL abortion is probably more prevalent at the present time than it has ever been. It is a subject in which both the medical and legal professions are intimately concerned, and I hope one on which an interesting discussion may take place. It is in this country looked upon as a serious crime, and is classed among the felonies.

It must be remembered that all abortion is not criminal. There is such a thing as therapeutic abortion. The laws of England do not formally recognize the induction of premature labour for medical reasons by doctors. Judges have, however, always held that medical men are justified in procuring abortion if the object be to save the life of the mother, or child, or both; or to save the mother from the risks of severe illness. In the same way, the law does not recognize the legality of surgical operations. The Statute of Wounding which was passed in pre-operative days makes no exception for surgical procedures, and any surgeon who performs an operation is, according to the strict letter of the law, guilty of unlawful wounding.

The first general medical agreement upon the question of inducing abortion for medical reasons was in 1756, when there was a consultation of the most eminent medical men in London to consider the moral rectitude of and the advantages which might be expected from this practice. It met with general approval. But in spite of the fact that the law in practice, though not in theory, permits the performance of therapeutic abortion, it is well that every medical practitioner should be very cautious before undertaking such a

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longed neurasthenic condition, abdominal operation followed by *B. Coli* cystitis.

Her elder sister (only other in family): Seven years previously chronic intestinal catarrh and jaundice, urine *B. Coli*.

While not rare, *B. Coli* sinusitis in pure culture is uncommon; it is remarkable that, all through, the family displayed *B. Coli* infection. Probably the elder sister infected the sister F., and the mother was probably infected by her daughters.

TABLE H.

(Dr. T. C. Graves's case).

Father, 64. 35 years, chronic rhinitis. Mother, 63. Gross oral sepsis, neurasthenic.

Sister 38. Recurrent nasal catarrh. Not very de- finite.	Brother 42. From boy- hood chro- nic rhinitis.	Brother 41. Chronic rhi- nitis. Oper- ation ad- vised but declined.	Brother 29. Scarlatina 13. Subse- quent sepsis subinfec- tions, den- tal, etc.	I. R. age 19½ Insane. Scarlatina 3 Otitis. Nasal catarrh. Mastoiditis. Double an- tral operation. Dental.
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Apparent familial nasal sepsis infection involving all but one child. Of the two having scarlatina together, I.R. developed mas-
toiditis and sinusitis and became insane, until Mr. Stirk Adams's
operative elimination of the focal sepsis restored her mental
equilibrium.

Behind the euphemism "a chronic cold" there often hides a disastrous menace, for even among the few examples I have furnished there is good reason to believe that early and effective treatment of parental nasal infection would have saved many serious abdominal operations without taking into consideration manifestations of conveyed infection in other territories. If preventable, how needless is the waste in impaired health and lost opportunities, apart from the direct financial cost involved.

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¹ "Nasal Sinus Infection as a causal factor in Appendicitis," Patrick Watson-Williams, *THE PRACTITIONER*, April, 1921.

² "Nasal and Oral Focal Sepsis in the Etiology of Gastro-intestinal and Pulmonary Infective Diseases," Patrick Watson-Williams and F. A. Pickworth, *British Medical Journal*, June 2, 1928.

³ *Journ. of Laryng., Rhin., and Otol.*, vol. xxxv, no. 4, April, 1920.

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The first general medical agreement upon the question of inducing abortion for medical reasons was in 1756, when there was a consultation of the most eminent medical men in London to consider the moral rectitude of and the advantages which might be expected from this practice. It met with general approval. But in spite of the fact that the law in practice, though not in theory, permits the performance of therapeutic abortion, it is well that every medical practitioner should be very cautious before undertaking such a

procedure. It is a well-recognized rule of our profession that a second opinion should be taken before abortion is procured, even though the medical reasons for the operation may be quite clear and distinct.

The law dealing with criminal abortion is quite plain and simple, and is laid down in sections 58 and 59 of the Offences Against the Person Act, 1861, as follows:

Section 58.—"Every woman, being with child, who with intent to procure her own miscarriage shall unlawfully administer to herself any poison or other noxious thing, or shall unlawfully use any instrument, or other means whatsoever, with like intent, and whosoever, with intent to procure the miscarriage of any woman, whether she be or be not with child, shall unlawfully administer, etc., shall be guilty of felony." The punishment for such offence is penal servitude for life, or for not less than three years, or imprisonment, with or without hard labour, for not more than two years.

Section 59.—"Whosoever shall unlawfully supply or procure any poison or other noxious thing, or any instrument or thing whatsoever knowing that the same is intended to be unlawfully used or employed with intent to procure the miscarriage of any woman, whether she be or be not with child, shall be guilty of a misdemeanour, and, being convicted thereof, shall be liable, at the discretion of the court, to be kept in penal servitude for the term of three years, or to be imprisoned for any term not exceeding two years."

The wording of these sections makes it clear that if any second person attempts to procure abortion on a patient, the question of pregnancy does not arise. Whether the woman is with child or not, the crime is the same. Neither does the success or failure matter. The mere attempt is what constitutes the crime.

The production of abortion, whatever the means, is a serious matter. The ignorance, in so many cases, of the operator frequently leads to the death or severe illness of the patient. If death results from criminal abortion brought about by a second person the crime is wilful murder, and the penalty death. The law was thus stated by Lord Justice Bramwell in *Stadt-mühler's case* at the Liverpool Winter Assizes, 1858. "If a man, for an unlawful purpose, used a dangerous instrument, or other means, and thereby death ensued,

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that was murder, although the person dead might have consented to the act which terminated in death, and although possibly he might very much regret the termination that had taken place contrary to his hopes and expectations. This was wilful murder. The learned counsel for the defence had thrown on the judge the task of saying whether the case could be reduced to manslaughter. There was such a possibility, but to adopt it would, he thought, be to run counter to the evidence given. If the jury should be of the opinion that the prisoner used the instrument, not with any intention to destroy life, and that the instrument was not a dangerous one, though he used it for an unlawful purpose, that would reduce the crime to manslaughter. He really did not think that they could come to any other conclusion than that the instrument was a dangerous one, if used at all. Then, if it were so used by the prisoner, the case was one of murder: and there was nothing but a verdict, either of acquittal or murder."

Abortion is in its very nature a secret crime. The operator and the patient act in collusion against the law. Thus the patient becomes the accomplice of the criminal. Naturally the law is very particular as to the evidence of accomplices. The celebrated judge, Fitzjames Stephen, has laid it down that when the only proof against a person charged with a criminal offence is the evidence of an accomplice, uncorroborated in any material particular, it is the duty of the judge to warn the jury that it is unsafe to convict anybody on such evidence, although they have a legal right to do so.

A question which has arisen in trials for criminal abortion is this. What is the meaning of "noxious thing"? In a case at the Kent Assizes, 1880 (*R. v. Cramp*), a prisoner was indicted for administering ~~a~~ poison or other noxious thing to a woman ~~with intent~~ to produce abortion. The noxious ~~thing~~ given was

procedure. It is a well-recognized rule of our profession that a second opinion should be taken before abortion is procured, even though the medical reasons for the operation may be quite clear and distinct.

The law dealing with criminal abortion is quite plain and simple, and is laid down in sections 58 and 59 of the Offences Against the Person Act, 1861, as follows :

Section 58.—"Every woman, being with child, who with intent to procure her own miscarriage shall unlawfully administer to herself any poison or other noxious thing, or shall unlawfully use any instrument, or other means whatsoever, with like intent, and whosoever, with intent to procure the miscarriage of any woman, whether she be or be not with child, shall unlawfully administer, etc., shall be guilty of felony." The punishment for such offence is penal servitude for life, or for not less than three years, or imprisonment, with or without hard labour, for not more than two years.

Section 59.—"Whosoever shall unlawfully supply or procure any poison or other noxious thing, or any instrument or thing whatsoever knowing that the same is intended to be unlawfully used or employed with intent to procure the miscarriage of any woman, whether she be or be not with child, shall be guilty of a misdemeanour, and, being convicted thereof, shall be liable, at the discretion of the court, to be kept in penal servitude for the term of three years, or to be imprisoned for any term not exceeding two years."

The wording of these sections makes it clear that if any second person attempts to procure abortion on a patient, the question of pregnancy does not arise. Whether the woman is with child or not, the crime is the same. Neither does the success or failure matter. The mere attempt is what constitutes the crime.

The production of abortion, whatever the means, is a serious matter. The ignorance, in so many cases, of the operator frequently leads to the death or severe illness of the patient. If death results from criminal abortion brought about by a second person the crime is wilful murder, and the penalty death. The law was thus stated by Lord Justice Bramwell in *Stadt-mühler's case* at the Liverpool Winter Assizes, 1858. "If a man, for an unlawful purpose, used a dangerous instrument, or other means, and thereby death ensued,

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that was murder, although the person dead might have consented to the act which terminated in death, and although possibly he might very much regret the termination that had taken place contrary to his hopes and expectations. This was wilful murder. The learned counsel for the defence had thrown on the judge the task of saying whether the case could be reduced to manslaughter. There was such a possibility, but to adopt it would, he thought, be to run counter to the evidence given. If the jury should be of the opinion that the prisoner used the instrument, not with any intention to destroy life, and that the instrument was not a dangerous one, though he used it for an unlawful purpose, that would reduce the crime to manslaughter. He really did not think that they could come to any other conclusion than that the instrument was a dangerous one, if used at all. Then, if it were so used by the prisoner, the case was one of murder: and there was nothing but a verdict, either of acquittal or murder."

Abortion is in its very nature a secret crime. The operator and the patient act in collusion against the law. Thus the patient becomes the accomplice of the criminal. Naturally the law is very particular as to the evidence of accomplices. The celebrated judge, Fitzjames Stephen, has laid it down that when the only proof against a person charged with a criminal offence is the evidence of an accomplice, uncorroborated in any material particular, it is the duty of the judge to warn the jury that it is unsafe to convict anybody on such evidence, although they have a legal right to do so.

A question which has arisen in trials for criminal abortion is this. What is the meaning of "noxious thing"? In a case at the Kent Assizes, 1880 (*R. v. Cramp*), a prisoner was indicted for administering a poison or other noxious thing to a woman with intent to produce abortion. The noxious thing given was

half an ounce of juniper oil. The jury found the prisoner guilty, and the question of the meaning of a noxious thing was reserved for the consideration of the C.C. for Cases Reserved. The matter had been previously raised in respect to cantharides which in that case had been given in exceedingly small doses. Lord C. J. Cockburn and Mr. Justice Hawkins decided that the cantharides was not a noxious thing, on the ground that not enough of the drug had been given to do any harm. The question before the Court in the Cramp case was: Must the drug be injurious or noxious in itself, and not merely when administered in excess? The Court decided:

That in each case it was a question for the jury to say whether the substance administered as it was, and under the circumstances in which it was administered, was a noxious thing. Therefore neither principle nor authority preclude us from holding what is certainly good sense, that if a person administer, with intent to produce miscarriage, something which as administered is noxious, he administers a noxious thing.

Once again, in spite of popular belief, law and common sense agree.

It will be noticed that the Act says that if a woman makes the attempt on herself to procure abortion, she must be pregnant when she does this, or there is no offence. If the attempt is made by another person, then whether the patient is pregnant or not is immaterial—it is a felony in either case.

Up to about the end of last century the abortionist who killed his patient was invariably charged with murder. Mr. Justice Hawkins, in passing sentence of death on an abortionist (*R. v. Culmore*, 1881), said: That the offence amounts to wilful murder is the law as it at present stands, and as in all human probability it will exist in time to come.

About twenty-five years ago juries began to show their unwillingness to convict on the capital charge, and reduced the crime to manslaughter. The Crown then ceased endeavouring to obtain a conviction for

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murder, relying on the manslaughter charge instead. In the case of Palmer, in January of this year, the Crown reverted to the old rule charging the man with murder, but the grand jury threw out the Bill, and he was tried for manslaughter and, as will be remembered, received a sentence of seven years' penal servitude.

The means employed to procure abortion may be divided into three classes: (a) violence applied generally; (b) the administration of drugs; (c) mechanical injuries inflicted on the uterus and its contents.

(a) *Violence applied generally.*—Women have been known to roll down hill, to throw themselves downstairs, or submit to kicks in the abdomen in order to procure abortion. None of these methods can be relied on. I will mention one or two cases to illustrate this point:

Case 1.—A man who had seduced his maid and wished to make her abort, mounted himself and the girl on a horse, then galloped up and down, and threw the girl on the ground whilst at full gallop. Twice he tried this without the desired result. He then conceived the horrible idea of applying to her abdomen some bread taken very hot from the oven. This failed. The girl ultimately gave birth to a full-term child, well formed, and none the worse for the brutal treatment inflicted on its mother.

Case 2.—The next case is not a criminal one, but it illustrates the point I made that excessive violence does not necessarily lead to abortion. A young lady wished to travel from California to Munich to have her baby. In crossing the Isthmus of Panama a railway collision occurred. She next embarked for Portsmouth. The passage was very bad, and she had several accidents on board. On reaching Paris she fell from the top to the bottom of the stairs at her hotel. Next day she departed for Munich, where she in due course had a perfectly natural confinement.

(b) *Administration of drugs.*—Those used include emetics such as tartar emetic, violent purgatives such as croton oil and gamboge, ergot, rue, savin, belladonna, cantharides and a host of others. The efficacy of all of these is extremely doubtful. In most cases, even when given in large doses, all they do is to make the patient ill, sometimes dangerously so, without

half an ounce of juniper oil. The jury found the prisoner guilty, and the question of the meaning of a noxious thing was reserved for the consideration of the C.C. for Cases Reserved. The matter had been previously raised in respect to cantharides which in that case had been given in exceedingly small doses. Lord C. J. Cockburn and Mr. Justice Hawkins decided that the cantharides was not a noxious thing, on the ground that not enough of the drug had been given to do any harm. The question before the Court in the Cramp case was: Must the drug be injurious or noxious in itself, and not merely when administered in excess? The Court decided:

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was charged with feloniously using an instrument with intent to procure the miscarriage of the prosecutrix. The defence was that Venn used a speculum to ascertain whether the woman was pregnant or not. He was acquitted. He was lucky. He had used the speculum twice, once in a coppice and the second time in a field. The jury must have been very liberal minded. It is not, I believe, the habit of our profession to make very delicate examinations on their female patients in open fields or woods.

Palmer, referred to on page 103, received seven years' penal servitude for procuring abortion. The method employed by him was the injection of soap and water into the uterus. The sudden distension of the womb caused shock from which the patient died. There have been several cases like this. Vibert records one in which the operator, a skilled abortionist, was just beginning to give an intrauterine injection when the patient complained of distress, asked the operator to stop, became unconscious, and died in a few minutes.

It is well known that cases of criminal abortion rarely come before the Courts unless the result has been fatal to the mother. As the woman solicits the crime, and is a culpable party, it is only natural that she should strive to conceal it. In this she is usually successful, unless her life is endangered, when the necessity for legitimate medical advice puts others in possession of the secret. Fatal results are mostly due to ignorance or to recklessness on the part of the operator or to carelessness on the part of the patient. It must also be remembered that the proceeding is usually carried out hurriedly and secretly, without proper assistance or proper precautions. Abortionists are frequently of intemperate habits, and, under the influence of drink, they lose proper caution and often do great damage or set up sepsis. The patient, too, is frequently obliged to carry on her usual occupation as if nothing were

procuring abortion.

I quote a few illustrative instances :

Case 3.—*R. v. De Baddeley and wife.* Here ergot was given with the intention of procuring abortion. The prisoners pretended to be clairvoyants through which means they discovered the condition of their dupes and the proper drugs to give. They were detected and sentenced to one year's imprisonment.

Case 4.—A case occurred at Brighton, in 1864, in which a question arose respecting the fatal effects of ergot on a woman who had taken it for a long time in order to procure abortion. She died without the anticipated result. The matter at issue was whether the drug had, or had not, caused death. The dose taken was about one teaspoonful of tincture of ergot three times a day for eleven weeks. The autopsy revealed signs of inflammation of the stomach and no other cause for death.

(c) *Mechanical means applied to the uterus and its contents.*—These include the passing of such instruments as a sound, pieces of wood, knitting needles, catheters, skewers, twigs of trees, the injection of soap and water into the womb, etc. This is the most frequent of the methods employed. Cases under this heading are as follows :

Case 5.—At the Durham Assizes Margaret Tinckler was indicted for the murder of Janet Parkinson by inserting pieces of wood into her womb. Deceased took to her bed on July 2 and died on the 23rd. She was about five or six months pregnant. She went to the prisoner, a midwife, who took her round the waist and violently shook her five or six times, tossing her up and down. At the necropsy the womb of the mother was found to have two holes caused by wooden skewers.

Case 6.—A woman, aged 26, was six months pregnant. She went to a quack, who operated on her. She died twelve hours later. At the post-mortem the abdominal cavity was found full of blood. There was a hole in the womb and a perforation in a very large artery—the internal iliac. There were also three other holes in the uterus. This shows gross ignorance and carelessness on the part of the abortionist.

The following is a really remarkable instance of the damage which an ignorant person can do. Abortion, in a certain case, was procured by means of a long piece of wire. This was found to have been pushed in so far that it had gone right through the peritoneal cavity into the lung.

At the Exeter Lent Assizes in 1854, Venn, a surgeon,

better known as Mr. Justice Hawkins, in charging a grand jury, said :

I doubt very much whether a doctor called in to assist a woman, not in procuring an abortion, for that in itself is a crime, but for the purpose of attending her and giving her medical advice, could be justified in reporting the facts to the public prosecutor. Such action would be a monstrous cruelty. . . There might be cases when it was the obvious duty of a medical man to speak out, and it would be a monstrous thing for a medical man to screen a person going to him with a wound which it might be supposed had been inflicted in the course of a deadly struggle.

Lord Brampton's remarks were brought to the notice of the Royal College of Physicians of London, and in the result it obtained the joint legal opinion of Sir Edward Clarke and Mr. Horace Avory—the latter was then in practice at the junior Bar, but has since been raised to the Bench. They advised that a medical practitioner was not liable to be indicted for misprision of felony (an offence which is practically obsolete), merely because he does not give information in a case where he suspects that criminal abortion has been practised. There the matter rested till the close of 1914, when, at the Birmingham Assizes in December, Mr. Justice Avory had to deal with a case of alleged illegal operation upon a woman on whom three successive doctors had been in attendance. None of these doctors had given information to the police, and in consequence, there was no evidence upon which the prisoner who was charged with having performed the illegal operation could be put on her trial. In charging the grand jury, the judge made the following observations :

Under circumstances like these in the present case I cannot doubt that it is the duty of the medical man to communicate with the police or with the authorities in order that one or other of those steps may be taken for the purpose of assisting in the administration of justice. No one would wish to see disturbed the confidential relation which exists, and which must exist, between the medical man and his patient, in order that the medical man may properly discharge his duty towards his patient ; but there are cases, and it appears to me that this is one, where the desire to preserve that confidence must be subordinated to the duty which is cast upon every good citizen to assist in the investigation of a serious crime

the matter, going about her daily work. This adds immensely to the risk.

A very important question arises in connection with this subject of criminal abortion, and that is what is the duty of a doctor who is called in to attend a patient on whom the operation has been procured or attempted. This is by no means an uncommon experience to us. So many of the victims of the abortionist get so seriously ill that they call in their regular doctor, or, at any rate, a medical attendant. What is his duty? Some few years ago this point seriously engaged the attention of the profession.

Partly as the result of some *obiter dicta* of Mr. Justice Avory, the Royal College of Physicians went into this matter with great care. Counsel's opinion was taken, and the result of the deliberations of the College and of other bodies are so important that I feel justified in quoting them at length. The question as to how far a medical man, who obtains in his professional capacity knowledge of the commission of a criminal offence, is under a duty as a citizen to give information to the police authorities and so set the criminal law in motion, is one which is of great interest to the medical profession.

It is manifest that as a standing rule, applicable to the vast majority of cases, it is of the very highest importance that professional confidence should be respected and held inviolate. Probably the most frequent occurrence is that of the medical man called in to attend a woman upon whom he comes to the conclusion that an illegal operation has been performed, and in this case, at any rate, it is now safe to say that the doctor is under no obligation to, and indeed should not, divulge the information which he has obtained in his professional capacity.

In order to explain how the point has now arisen we must go back to 1896, when the late Lord Brampton,

such as is imputed to this woman. In consequence of no information having been given, it appears to me that there is no evidence whatever upon which this woman can properly be put upon her trial. I have been moved to make these observations, because it has been brought to my notice that an opinion to which I was a party some twenty years ago, when I was at the Bar, had been either misunderstood or misrepresented in a textbook of medical ethics, and I am anxious to remove any such misunderstanding if it exists. It may be the moral duty of the medical man, even in cases where the patient is not dying, or likely to recover, to communicate with the authorities when he sees good reason to believe that a criminal offence has been committed. However that may be, I cannot doubt that, in such a case as the present, where the woman is, in the opinion of the medical man, likely to die, and, therefore, her evidence likely to be lost, that it is his duty; and some one of these gentlemen ought to have done it in this case.

Mr. Justice Avory was therefore insisting that, professional secrecy notwithstanding, medical men are under the same moral duty as other citizens of the State in all cases in which they become aware of the commission of a criminal offence, to give information to the authorities. In this he differed from the late Lord Brampton.

These remarks were brought to the attention of the Council of the British Medical Association, and after full consideration of the matter, in consultation with the Solicitor to the Association, a deputation was appointed to confer with the Lord Chief Justice on the question raised. This deputation was received by the Lord Chief Justice, and the Attorney-General and the Public Prosecutor were present. It was then ascertained :

(1) That it is desired by the authorities that information should be given to them by the medical men in attendance upon a woman suffering from the effects of abortion brought about by artificial intervention.

(2) That the circumstances in which it was desired that this communication should be made was the subject of the following three limitations :

(a) That the medical man was of opinion, either from his examination of the patient and/or some communica-

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tion that she may have made to him, that abortion had been attempted or had been procured by artificial intervention.

(b) That he was of opinion, either from his observations and/or from a communication made to him by his patient, that such artificial intervention had been attempted by some third party other than the patient herself; and

(c) That the medical man was of opinion that his patient, due to such artificial intervention, was likely to die, and that there was no hope of her ultimate recovery.

Upon this the Council of the B.M.A. made the following observations in its report for 1915:

The Council understands that whereas solicitors and barristers have an absolute privilege of protection in regard to statements made to them in their professional capacity involving matters of criminal import or otherwise, no other class of person is accorded such legal protection by State authority or Act of Parliament, although in the case of ministers of religion such protection is universally observed and recognized by custom in the courts.

There is, however, no such universal protection attaching to medical men in respect of statements made to them by a patient; in fact, there is a considerable conflict of authority upon the subject.

The Council is advised that no obligation rests upon a medical practitioner to disclose the confidence of his patient without the patient's consent, and suggests that if the State desires to set up such an obligation it should at the very least preface such an endeavour by affording to the practitioner protection from any legal consequences that may result from his action. Without any desire to claim the right to refuse to make such disclosures in obedience to the order of a Court of Justice, the Council, after hearing the report of the deputation received by the Lord Chief Justice on May 3, 1915, has decided to adhere to the following resolutions which it passed on January 27, 1915:

That the Council is of opinion that a medical practitioner should not under any circumstances disclose voluntarily, without the patient's consent, information which he has obtained from the patient in his professional duties.

That the Council is advised that the State has no right to claim that an obligation rests upon a medical practitioner to disclose voluntarily information that he has obtained in the exercise of his professional duties.

The matter has also been taken up by the Royal College of Physicians of London. The College passed certain resolutions last July (i.e. in 1914). It was unanimously considered advisable to

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obtain an opinion from Mr. R. D. Muir on the legal advice appended to the resolutions, which were finally adopted in the following form after they had been submitted to the Public Prosecutor for his approval. The resolutions of the College and the advice it has received are in the following terms:

Resolutions concerning the duties of medical practitioners in relation to cases of criminal abortion adopted by the Royal College of Physicians of London on January 27, 1916.

The College is of opinion :

1. That a moral obligation rests upon every medical practitioner to respect the confidence of his patient, and that without her consent he is not justified in disclosing information obtained in the course of his professional attendance upon her.

2. That every medical practitioner who is convinced that criminal abortion has been practised on his patient should urge her, especially when she is likely to die, to make a statement which may be taken as evidence against the person who has performed the operation, provided always that her chances of recovery are not thereby prejudiced.

3. That in the event of her refusal to make such a statement he is under no legal obligation (so the College is advised) to take further action, but he should continue to attend the patient to the best of his ability.

4. That before taking any action which may lead to legal proceedings a medical practitioner will be wise to obtain the best medical and legal advice available, both to ensure that the patient's statement may have value as legal evidence, and to safeguard his own interests, since in the present state of the law there is no certainty that he will be protected against subsequent litigation.

5. That if the patient should die, he should refuse to give a certificate of the cause of death, and should communicate with the coroner.

The College has been advised to the following effect :

1. That the medical practitioner is under no legal obligation either to urge the patient to make a statement, or, if she refuses to do so, to take any further action.

2. That when a patient who is dangerously ill consents to give evidence her statement may be taken in one of the following ways. (These are legal points on which I will not comment.)

The position may therefore be thus summarized:

(a) Anyone who, knowing of the commission of a criminal offence, attempts to conceal his knowledge from the authority may himself be guilty of the offence of misprision of felony—an offence, however, which is practically obsolete.

(b) An ordinary citizen, not being a barrister or solicitor, is under a moral duty to inform the authorities

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when he has knowledge of the commission of a criminal offence.

(c) A medical man, however, is under no such moral duty where his knowledge is obtained in his professional capacity, so far, at any rate, as the offence of abortion is concerned.

Many controversial points are raised by this statement—points on which, I fear, it will be difficult to get the lawyers and the doctors in agreement.

The case of Dr. Collins is a typical example of the professional abortionist who has practised his occupation without fatal result. Then there happens an unexpected death of one of his victims, leading to discovery of his mode of life, conviction and ruin. The case excited a great deal of interest at the time of the trial.

Collins was at one time surgeon to the Guards, later a fashionable West End practitioner, and finally he degenerated into a professional abortionist. He was tried and convicted for the manslaughter of Mrs. Uzielli, receiving seven years' penal servitude for the offence.

Mrs. Uzielli, for whose death Collins was responsible, was a lady who took a prominent part in so-called fashionable society. She became pregnant, but not desiring any more children, on the recommendation of a friend she went to Collins who was well known in her circle as a professional abortionist. She paid him thirty guineas to perform the usual illegal operation. As the result of this the unfortunate woman died of septic peritonitis.

The trial took place before Mr. Justice Grantham at the Central Criminal Court in June, 1898. The Attorney-General, Sir Richard Webster, Mr. Sutton, Mr. Charles Matthews, and Mr. Bodkin appeared for the prosecution, whilst Dr. Collins was defended by Mr. C. F. Gill and Mr. A. E. Gill.

The Attorney-General in opening the case said that he had to put before the jury the facts which caused the death of Mrs. Uzielli on March 25, 1898. Dr. Collins, the prisoner, practised as a medical man at Cadogan Place, and had not been called in to see Mrs. Uzielli till March 14. She was in good health then. He attended her from March 14 to March 24, and during that time, according to statements the doctor made to Mr. Uzielli, there was nothing in the condition of Mrs. Uzielli to cause any alarm. He said that up to the last moment of his attendance there was not a single symptom to give rise to any anxiety. The jury had to consider whether or no her death was caused by anything done by Dr. Collins. Between March 14 and 24 something happened. After the death

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3. That in the event of her refusal to make such a statement he is under no legal obligation (so the College is advised) to take further action, but he should continue to attend the patient to the best of his ability.

4. That before taking any action which may lead to legal proceedings a medical practitioner will be wise to obtain the best medical and legal advice available, both to ensure that the patient's statement may have value as legal evidence, and to safeguard his own interests, since in the present state of the law there is no certainty that he will be protected against subsequent litigation.

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in many cases, if in the course of an attempt to commit a felony or an unlawful act, death was caused, it was or might be murder. But the jury would be told, no doubt, by his lordship that if on the evidence they came to the conclusion that the act done, though unlawful in itself, was not such as of necessity to cause danger to life if not unskilfully performed, it was open to them to find the prisoner guilty of manslaughter, not of murder, assuming, of course, that they considered that death was occasioned by his act. The point for the jury to decide after hearing the evidence was, What was the cause of death, and was it caused by anything which the prisoner did ?

The evidence given bore out the opening statement of the Attorney-General.

Chief Inspector Moore said he arrested Dr. Collins under a warrant for causing the death of Mrs. Uzielli by unlawfully using an instrument for the purpose of causing a miscarriage. Dr. Collins replied : "There is no truth whatever in the accusation. I never did anything to this lady except what was proper and legitimate." In the consulting room witness found a number of instruments, which he produced, one being a long, black, whalebone instrument, another a long yellow catheter.

Dr. Bertram Lyne Stevens in the course of his evidence said when he first saw Mrs. Uzielli she was dangerously ill. She died shortly after from septic peritonitis. There had been a miscarriage. He had found at the post-mortem that there was a place in the womb where the ovum had been attached. The wound in the uterus could not have come by itself ; it must have been caused by something applied mechanically. Looking at the distance from the vagina to the entrance to the womb he did not see how it could have been caused by the finger.

Mr. Thomas Bond said that in consequence of an order from the coroner he had made a post-mortem on the body of Mrs. Uzielli. On examining the uterus he found a recent wound about an inch and a-quarter from the mouth of the womb. It was in a septic condition. He thought it must have been caused by a blunt-pointed instrument, like a sound. He did not think it had been caused by a curette. Death was due to septic peritonitis.

Sir John Williams said that at the request of Dr. Stevens he saw Mrs. Uzielli. He found her in a dying condition suffering from septic peritonitis. He was not present at the post-mortem, but the parts taken away were shown him by Mr. Bond. The uterus had been pregnant about six weeks. About an inch and a-half from the mouth of the womb was a wound, and he formed the opinion that it had been made by some blunt-pointed instrument. In his view it could not have been caused by a finger-nail. The miscarriage was the cause of the peritonitis, and this was due to the instrument used being septic. If curetting had been done so recently as five days before there would have been visible evidence of it. There was none.

Mr. Gill, for the defence, called no witnesses. He remarked

there was a coroner's inquest and a post-mortem, and the cause of death was clearly disclosed. A wound was found about one inch and a-quarter on the inner side of the os internum of the womb, made by some blunt-pointed instrument. That this wound was the cause of death of Mrs. Uzielli was quite certain. Whether it was made by Dr. Collins or not was for the jury to determine. The prosecution contended that the wound was made on Tuesday, March 15, and that all the symptoms which occurred after that date were consistent, to use no stronger expression, with the wound having been caused on that date. At the time of her first seeing the prisoner, on March 14, she was seven or eight weeks pregnant. She was most anxious not to have a child, and had treated herself with various medicines with the object of restoring her monthly periods. When she came to London from the country she was undoubtedly a healthy woman about two months pregnant. A friend of hers to whom she made a statement as to her condition wrote to Dr. Collins asking him to see some one for her, not mentioning Mrs. Uzielli by name. The deceased went to the house of Dr. Collins with her friend on March 14, and saw him in the consulting room. Whether anything was done to her then he could not say. On the next day she went again to see the doctor, and this time paid a longer visit. The prosecution alleged that certainly on that day Dr. Collins had used an instrument on Mrs. Uzielli. He would deny it, and say he had only made a digital examination, or possibly one with a speculum. Undoubtedly she went into the consulting room and was there twenty minutes alone with the doctor. She went out apparently well on Wednesday and Thursday. On the latter day she sent Dr. Collins a cheque for thirty guineas. Dr. Collins suggested that he had told Mrs. Uzielli his fees were two guineas for the first visit, and one guinea later, and two guineas at the house of Mrs. Uzielli. The cheque for thirty guineas was for payment for the visits already made, and for future visits which he might make. On the Friday Mrs. Uzielli became ill and Dr. Collins attended three or four times a day. The next day the husband was very anxious about his wife, and spoke to the doctor about this worry. Mr. Uzielli was not satisfied, dismissed Dr. Collins and called in Dr. Stevens. He at once saw that Mrs. Uzielli was suffering from a very dangerous illness, acute septic peritonitis. Sir John Williams saw her the next day and pronounced her case hopeless. She died very shortly afterwards. It was for the jury to say what caused that state of things. Was it something done by the prisoner, or was it not? The post-mortem disclosed the cause of the septic peritonitis. Whatever might have been the cause of the wound in the womb it was undoubtedly this which set up the peritonitis from which Mrs. Uzielli died. At the request of Mr. Hall, a friend of Mr. Uzielli, Dr. Collins called on the morning after the death. He asked Mr. Uzielli if Dr. Stevens had refused to give a death certificate, and had suggested that he had done something illegal. It was for the jury to draw their own conclusions from these questions asked by the prisoner immediately after the death of Mrs. Uzielli. The coroner's jury had found Dr. Collins guilty of the murder of Mrs. Uzielli. The law was that

CRIMINAL ABORTION

in many cases, if in the course of an attempt to commit a felony or an unlawful act, death was caused, it was or might be murder. But the jury would be told, no doubt, by his lordship that if on the evidence they came to the conclusion that the act done, though unlawful in itself, was not such as of necessity to cause danger to life if not unskilfully performed, it was open to them to find the prisoner guilty of manslaughter, not of murder, assuming, of course, that they considered that death was occasioned by his act. The point for the jury to decide after hearing the evidence was, What was the cause of death, and was it caused by anything which the prisoner did ?

The evidence given bore out the opening statement of the Attorney-General.

Chief Inspector Moore said he arrested Dr. Collins under a warrant for causing the death of Mrs. Uzielli by unlawfully using an instrument for the purpose of causing a miscarriage. Dr. Collins replied : "There is no truth whatever in the accusation. I never did anything to this lady except what was proper and legitimate." In the consulting room witness found a number of instruments, which he produced, one being a long, black, whalebone instrument, another a long yellow catheter.

Dr. Bertram Lyne Stevens in the course of his evidence said when he first saw Mrs. Uzielli she was dangerously ill. She died shortly after from septic peritonitis. There had been a miscarriage. He had found at the post-mortem that there was a place in the womb where the ovum had been attached. The wound in the uterus could not have come by itself ; it must have been caused by something applied mechanically. Looking at the distance from the vagina to the entrance to the womb he did not see how it could have been caused by the finger.

Mr. Thomas Bond said that in consequence of an order from the coroner he had made a post-mortem on the body of Mrs. Uzielli. On examining the uterus he found a recent wound about an inch and a-quarter from the mouth of the womb. It was in a septic condition. He thought it must have been caused by a blunt-pointed instrument, like a sound. He did not think it had been caused by a curette. Death was due to septic peritonitis.

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Mr. Gill, for the defence, called no witnesses. He remarked

that one of the first points of difference between the case for the prosecution and that for the defence was the condition of health of Mrs. Uzielli in March. The prosecution alleged that she was a robust woman, whilst the defence said she was in bad health, and had had a previous attack of peritonitis. This being the case, she was in such a condition that peritonitis could be excited by a trivial cause. As to the medical evidence, he would remind the jury that if the case had been an action for damages against a railway company they could have had one man of distinction going into the box and saying that the shock would be disastrous to the plaintiff, while the medical man for the railway company would say that the symptoms were trifling and would soon pass away. He (counsel) was not in a position to call medical evidence. Dr. Collins had not the means to place his case before the jury in that way.

This is, of course, nonsense. No medical man would be refused help by his colleagues in such a matter if he had a just cause to plead. The reason Dr. Collins was not able to secure medical evidence in his favour was that his guilt was so patent.

When Mrs. Uzielli returned to town she was being supplied with medicines from some unknown source. Was a quack doctor treating her? How was she getting these medicines? Was it going much farther to suppose that she either got some ignorant person to operate upon her, or that she did herself some injury? Dr. Collins did not know whether Mrs. Uzielli were pregnant or not. Was it conceivable that any medical man would perform an operation under these circumstances? At least he would not commit it without some safeguard or without some motive. What was the motive if there had been any criminal intent? In March Mrs. Uzielli had drawn a cheque to self for three hundred pounds, and there would have been no means of tracing the money if it had been paid to a man for an illegal act. If Dr. Collins had agreed to perform an illegal operation he would surely have insisted on being paid in cash so that it could not have been traced. Dr. Collins had told the nurse that Mrs. Uzielli had had a miscarriage, and that he had tried to remove some membrane with his finger-nail. The wound of the womb could have been caused at that time, and once the wound was made there was abundant chance of sepsis. The doctor had then used a fine curette, as he had failed to remove membrane with his finger. No anæsthetic had been given, and it was quite possible that Mrs. Uzielli had flinched and herself caused the wound. The only safe verdict was that the case had not been proved and, therefore, Dr. Collins was not guilty.

The Attorney-General replied on behalf of the prosecution. He submitted that every fact in the case showed that Mrs. Uzielli was pregnant, that she knew she was pregnant, and acted to bring about that which she wished, namely, miscarriage. He commented

CRIMINAL ABORTION

on the absence of medical men in the witness box on behalf of the prisoner, and pointed out that in that great profession, which was generous and large-minded, there would have been no difficulty in procuring evidence in support of the views put forward on behalf of the prisoner if anyone had held them. With reference to the suggestion made that Mrs. Uzielli was being treated for suppressed menstruation, it was most important to observe that when she got back to the house after the visit to Dr. Collins she gave directions to the maid for something that was going to happen. Dealing with the post-mortem examination, the Attorney-General said that there was evidence that there had recently been an ovum in the womb, and that this ovum had been expelled. There was also evidence that four or five or six days before the death of the lady there had been a heavy discharge from the womb. It was perfectly clear that Mrs. Uzielli had died from septic peritonitis. This was not disputed. It was also known that a wound in the position the wound was found would be responsible for the mischief. It was known also that the ordinary course of septic peritonitis was that it developed two or three days after the poisoning, and was followed by rise of temperature, feverishness, and restlessness supervening about three or four days after infection. It was practically established that the miscarriage was the result of something done on the Tuesday, and that it was brought about by the puncturing of the membrane either by a metallic or other sound. The statement that the wound was the result of curetting must be discredited. If the curetting did take place, it was a remarkable thing that there should have been no mark or sign of any kind of it. He protested against the suggestion of the defence that Dr. Collins had been treated in any unfair way, or that any improper attempt had been made to get up evidence against him. With regard to the law of the case the Attorney-General pointed out that the prisoner was charged with constructive wilful murder, because if he were committing an unlawful act the law said that in one view death thereby occasioned was murder. But the law also said that if the act were not in itself of necessity dangerous, then the jury might find a verdict of manslaughter. If the jury had any doubt whether the prisoner caused the death of Mrs. Uzielli, he invited them to give the prisoner the benefit of that doubt. But if they had no reasonable doubt that her death was caused by the act of the prisoner, they were bound to do their duty and return such verdict as was in accordance with their conscience.

Mr. Justice Grantham in his summing-up said that nothing could have been better than the defence made by Mr. Gill. With regard to the law there was no doubt as to its meaning. A person who, with intent, procured the miscarriage of any woman by the unlawful use of an instrument was guilty of a felony. It could be well understood that there were cases where it was necessary, in order to save the life of a woman, that there should be a forcible miscarriage, and a properly qualified doctor had to say when that time arrived. That was not unlawful. If in consequence of an unlawful operation the patient died, that was murder. But he could not ignore the fact that juries not unnaturally declined

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Diverticulitis.

By RICHARD WARREN, M.D., M.Ch., F.R.C.S.

Surgeon to the Weston-super-Mare Hospital; late Surgeon to the London Hospital, etc.

DURING the past two or three decades it has become clear that diverticula of the large bowel are by no means uncommon. Their origin is obscure, and congenital errors in development seem as likely a reason as any. In practice, however, we are not concerned with their origin, but with their termination. As long as diverticula do not undergo secondary changes they are symptomless and harmless, just as are the normal diverticula of the intestine—namely, the appendix vermiformis and the gall-bladder—and the condition may be called diverticulosis. The situation is usually in the descending colon and sigmoid, but may occur high up near the cæcum. When, however, secondary changes occur, the hitherto innocent diverticulum is as much a source of evil as any appendix.

As in the normal diverticula, there is a tendency for concretions to form in these little protrusions of large gut, and these in turn lead to important and serious sequelæ, acute inflammation with perforation and peritonitis, which is usually circumscribed, forming an abscess, or the perforation may take place into another viscus, of which the bladder is reputed to be the most common, although I have not met with this condition. Chronic inflammation around a diverticulum, with proliferation of fibrous tissue and the formation of a local tumour causing obstruction of the bowel, is, perhaps, the most classical type.

Clinically, then, we have a type which presents itself as a pelvic abscess, another which is a chronic

to find a verdict of murder when the person performing the operation did not do it against the will of the person operated on; when, in fact, he was bribed to do it. The operation was an illegal one, and any person who submitted to it was herself guilty of the same felony as the person who performed it. But unfortunately in most cases the woman had paid the penalty and had gone before another Judge. It had been suggested that prisoner had been unable to find medical witnesses owing to poverty; but there was very little foundation for that statement.

His lordship then proceeded to review the evidence. There was no doubt that the case would never have been started but for the statement of Dr. Stivens; and his conduct had been commented upon. Yet in all the cases he had ever tried he had never had one in which it was so clearly the duty of the doctor in attendance to do exactly what Dr. Stivens had done on this occasion. The real questions for the jury were: (1) Was the woman pregnant? (2) Did she have a miscarriage? Dr. Collins admitted that Mrs. Uzielli had had a miscarriage. As regards the condition of Mrs. Uzielli on the day before her death, Dr. Stivens the moment he saw her knew what she was suffering from. That was only an hour or two after Dr. Collins had left, and it seemed incredible that he was ignorant of the true nature of the disease. It was difficult to understand why he should fear an inquest if he had been properly treating his patient. There was not a tittle of evidence to confirm the suggestion that the abortion was brought about by somebody else. The result of the medical evidence was that death was due to septic peritonitis, and that this had been caused by a wound. How the wound was made was the question on which the whole case turned. If the evidence pointed out that it was brought about by artificial means, the question was, Who could have done it? If the jury believed that Dr. Collins had given an untrue account of his position, then they were justified in coming to the conclusion that the other evidence pointed strongly to the fact that his must be the hand that did it.

The jury, after deliberating fifty minutes, found the prisoner guilty of manslaughter and strongly recommended him to mercy.

There could be no doubt of the guilt of Dr. Collins. Why the jury should have strongly recommended him to mercy is difficult to understand. He was sentenced to seven years' penal servitude.

DIVERTICULITIS

plenty of bowel on either side (under the misapprehension that it was a cancer), and a Paul's tube was placed in the upper end. On examination the mass proved to be not a cancer, but a diverticulum containing a concretion, and very nearly perforated and surrounded by much fibrosis, the contraction of which had narrowed and kinked the gut, causing obstruction. At a second operation the colostomy was excised and an end-to-end anastomosis done. Owing to the free removal of gut the junction was difficult, and a faecal fistula resulted, which took some months to heal. Now, after six years, the patient is very well and active. If one had known that it was not a cancer less would have been removed, and the anastomosis would have been easier. The tendency to perforate locally is strong evidence against growth; I have not seen a cancer of the sigmoid perforate locally. Perforation in these cases occurs typically in the caecum, due to over-distension from obstruction.

Case 4.—A female patient, aged sixty-eight, three weeks previously had pain and tenderness in the left iliac fossa, which subsided in three to four days. She had again been suffering from a similar attack for a few days, there were severe attacks of pain, the tenderness was considerable and the temperature 101°. On this occasion we diagnosed diverticulitis and operated soon after. Laparotomy revealed a mass in the descending colon and many diverticula higher up, which were not inflamed. The mass was excised with a margin of about 2 in., and contained three diverticula, two of which were quiescent, the third acutely inflamed, with much surrounding peridiverticulitis, which narrowed and kinked the gut. There was a faecal knob which could not pass the stenosed part, and perhaps accounted for the severe attacks of pain, almost amounting to colic. The risk of removing all the diverticula-bearing region of colon, which was extensive, seemed too great to run (the patient frequently had myocardial attacks), so an end-to-end anastomosis and a temporary valvular caecostomy concluded the operation. Two years later she is in good condition and has not, so far, developed inflammatory changes in any of the remaining diverticula.

Case 5.—A man of seventy suffered from constipation and inability to pass flatus for the best part of a week, during which time he took purges, with no result except abdominal distension, when he at length sought medical advice. On inquiry it was found that he had had a laparotomy performed for a supposed cancer of the stomach 2½ years before, but nothing was found. Laparotomy was performed at once. There was huge distension of the caecum and the lower part of the small intestine, and a lump could be felt in the sigmoid, which was taken for a cancer. It could not be closely examined owing to the shortness of the meso-sigmoid, the great distension, and the condition of the patient. The transverse colon was adherent to the laparotomy scar, so nothing remained but to tie a Paul's tube into the caecum. Unfortunately, the patient had waited too long, and died in twenty-four hours. Some months later I had a note from a physician who had attended this patient several years before and had made a diagnosis of diverticulosis with the aid

subacute intestinal obstruction (obstruction low down), although usually in these cases also there is some suggestion of peritoneal irritation, such as local tenderness, rigidity and pyrexia. The first type may be recognized as an abscess and be operated on as such, or may perforate some adjoining viscus and result in a fistulous opening.

Case 1.—A middle-aged woman had a large pelvic abscess; on exploration this was found to contain faeculent pus, but the caecum and appendix appeared relatively healthy. The greater amount of infiltration, lymph and adhesions were in the region of the sigmoid, but there was too much matting to allow of accurate examination. A second operation later to find the diverticulum failed on account of the density of the adhesions in the pelvis. When last seen a purulent fistula remained.

Case 2.—A female patient, aged seventy-six, with a history of apparent gall-stone attacks, myocardial changes, and almost constant asthma, developed an attack of abdominal pain with constipation, dirty tongue, some abdominal distension, and slight pyrexia. There was tenderness in the lower abdomen, and on examination a few days later, per vaginam, a tender resistant mass in the left fornix. She seemed to be a quite unsuitable risk for an exploratory operation or, indeed, for anything more than opening an abscess if one could be definitely located, so expectant measures were adopted. Her condition gradually improved, and about three to four weeks later there commenced a faeculent discharge of pus from the vagina. The patient's condition constantly improved, but the vaginal discharge persisted and proved to come from the uterus. Her general condition seemed to put out of court any attempt at radical cure, and ultimately, after five months, the discharge ceased. It is, however, too early to feel confident that the condition is cured. Of course, this might have been a case of appendicitis; but the position of the tender swelling in the left fornix and initial suggestion of subacute obstruction make it highly probable that the condition was one of diverticulitis of the sigmoid, with abscess perforating through the uterus.

Turning now to cases definitely proved, the following are of interest:

Case 3.—A man, aged sixty, had a history of two days' abdominal pain, pyrexia to 102° , and was found to have a lump in the left iliac fossa, which was tender. He had been distended with flatus, but was relieved by enemata and was clearly a case of subacute intestinal obstruction. Laparotomy forthwith revealed apparently a cancer of the sigmoid, nodular and contracting, almost perforated in one place, where there was a yellow, sloughy spot (this should have put us on the right track). The mass was mobilized by dividing the peritoneum on the outer side of the sigmoid, and excised with

The Reflexes and Muscular Atrophies in Arthritis Deformans of the Hip Joint.

By STANLEY M. RENDALL, M.D.,

Mentone and Aix-les-Bains; Chevalier de la Légion d'Honneur.

ARTHRITIS deformans of the hip joint may take the form of rheumatoid arthritis or of osteo-arthritis or of fibrositis of the capsule. The etiology and pathogeny in these varieties of hip-joint disease may at times be doubtful, but in general the rheumatoid variety is the result of a septic infection, and begins in the synovial membrane, and later may implicate the cartilage and bone; the osteo-arthritic variety is frequently the result of trauma (bruise or strain), and in the beginning affects the cartilage or bony part of the articulation. The fibrositic variety may result from traumatism or from a toxæmia of a less specific type than that causing the rheumatoid arthritis, or more usually from a combination of these etiological factors. The fibrositic variety is most frequently met with. In 145 consecutive patients that came under my care, fibrositis obtained in 100 cases, osteo-arthritis in 42 and rheumatoid arthritis in 3.

In those with an arthritic diathesis there is, amongst its other manifestations, a peculiar tendency to articular morbid changes under the influence of any of the numerous toxic substances that cause so-called gouty attacks. What determines the localization of this tendency to one or other of the articulations is often difficult to decide. Frequently it is the result of a

THE PRACTITIONER

of barium and X-rays, so there can be no reasonable doubt that the mass felt was a peridiverticulitis causing obstruction.

DIAGNOSIS.

As regards diagnosis, although the operative findings make one think of cancer, clinically the picture much more resembles an inflammatory condition, e.g. appendicitis, which is perhaps natural because of the occurrence of pyrexia and local tenderness, which are uncommon in cancerous obstruction, while the presence of a tumour in the left iliac fossa is, at any rate, not common in cancer of the sigmoid. The general condition of the patient as regards obesity is of little value, as early obstruction from cancer occurs in the fat and lean alike, and until secondary growths in liver or elsewhere are widespread there is seldom much evidence of cancerous cachexia.

TREATMENT.

Where inflammatory changes have taken place, i.e. where diverticulitis has supervened on diverticulosis, there can be little doubt that removal of the mass and anastomosis is the line to take where feasible. The question is how much to remove; if there are only one or a few diverticula close together, it is simple if the patient's condition is reasonably good; and there is not the same reason to remove colon freely as there is for a cancer (the mistake made in Case 3). Where, however, there are many diverticula, in view of the age and general state these patients are likely to be in, it may seem an unreasonable risk to remove such a large amount of colon as would be necessary to eradicate entirely all the diverticula, and it will be wiser to adopt medical measures—laxatives, paraffin, possibly enemata. Such patients will need careful supervision in case inflammation occurs in one of the diverticula. This will be the line to take where diverticulosis without inflammatory changes is found on X-ray examination of patients.

by sectioning the corresponding posterior nerve roots. Hoffa went farther and, irritating the joints on both sides, cut the root on one side and found the reflex atrophy only appeared on the opposite or uncut side whose reflex arc was undisturbed. This relation of the affected synovial membrane to muscular atrophy is confirmed by the clinical difference existing between the infectious and traumatic varieties of arthritis deformans of the hip joint.

In the infectious rheumatoid variety primarily affecting the synovial membrane there is a rapid onset of the characteristic muscular atrophies and increased reflexes apparently depending as to their degree upon the nature of the infection and its irritant properties; in the traumatic form primarily affecting the bone, neither the muscular atrophy nor the exaggeration of the reflexes, if they exist, ever reaches the same degree as in the toxic form, and vary as to their amount, depending upon whether the traumatism originally implicated the synovial membrane or not, or whether this latter becomes affected secondarily.

There is almost always an exaggeration of the knee-jerk in disease of the hip joint, marked in the rheumatoid, and less marked in the osteo-arthritic and fibrositic forms; in the latter, it may at times be barely perceptible, and require reinforcement to make it so, or may even be absent. The more marked the atrophy of the muscles in connection with the hip joint the more pronounced as a rule is the increase of the knee-jerk. There is no apparent relationship between the pain and the increased tendon reflex. Evidently the greater the degree of muscular atrophy the greater the changes in the cells in the grey matter of the anterior cornua which control the nutrition of these muscles, and in the terminations of the pyramidal tract in this grey matter; any lesion which affects these terminations sets up an exaggeration of the reflex tonus in the spinal

traumatism, in other cases it arises from undue strain upon the joint, lasting over a long period, the result of continually assuming one position, either from habit or dictated by occupation.

The rôle of the nervous system in the development of the lesions in arthritis deformans seems to be inadequately recognized, although the analogy between them and those found in the spinal arthropathies is remarkable, and if the part played by the trophic nervous centres in the pathogeny of articular disease be admitted, it does not in any way diminish the importance of a bacterial or other factor. Admitting this nervous element, where is the beginning of the vicious circle set up between the articulation and its trophic centre in the cord? Is it always in the medullary cells or always in the joint, or sometimes in one, sometimes in the other, both finally becoming affected, the one secondary to the other and mutually reacting on each other, the irritation in the joint reflexly producing by over-stimulation a change in the nutritional condition of the trophic centre, and it, in its turn, causing morbid changes in the articulation?

There are apparently two nutritional centres in the cord in connection with the joints—one situated in the grey matter of the anterior cornua, in relation with the synovial membrane of the articulations, influencing their nutrition and that of the muscles in physiological connection with them, and the other centre in the column of Clark in relation with the bony parts and fibrous tissue of the joints. "The arthropathies in syringomyelia and tabes would seem to be dependent upon lesions of Clark's columns." (Church and Peterson.)

Valtat showed by his experiments that the synovial membrane was always the seat of the irritation which by its reflex influence on the spinal centres produced muscular atrophy. Raymond prevented this atrophy

ARTHRITIS DEFORMANS

by sectioning the corresponding posterior nerve roots. Hoffa went farther and, irritating the joints on both sides, cut the root on one side and found the reflex atrophy only appeared on the opposite or uncut side whose reflex arc was undisturbed. This relation of the affected synovial membrane to muscular atrophy is confirmed by the clinical difference existing between the infectious and traumatic varieties of arthritis deformans of the hip joint.

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centres that are adjacent to them.

The atrophy of the muscles secondary to hip-joint disease affects primarily and often to the greatest extent the flexor group, whose nerve supply is in connection with the cells in the second, third and fourth spinal segments. These three segments also contain the centre for the knee reflex; we should therefore expect, what actually occurs, an exaggeration of the knee-jerk on the affected side. We should also anticipate, and clinical experience confirms this, a more or less frequent increase in the other reflexes that have their centres in this region of the cord.

The nutritional, motor and sensitive centres of the hip joint are grouped in the lumbar enlargement from the second lumbar to the third sacral segments inclusive. In the same area from above downwards lie part of the cremaster reflex (L 1, 2), the periosteal reflex of the adductor muscles (L 2, 3, 4), the patellar tendon reflex (L 2, 3, 4), the periosteal reflex of the hamstring muscles (L 4, 5, S 1), the gluteal skin reflex (L 4, 5, S 1), the Achilles tendon reflex (L 5, S 1, 2), and plantar skin reflex (L 5, S 1, 2).

The knee-jerk is the most constantly and most markedly increased of all these reflexes. This predominance may in part be due to the ease with which it is demonstrated, both from its position and the large excursion which the size of the muscular mass brought into play and the length of the lever moved by it produce; but the increase of the others will be found in a large proportion of cases of rheumatoid arthritis of the hip joint. Next in frequency to the knee-jerk comes, in my experience, the adductor tendon reflex, and this we should expect from the close proximity of their respective centres in the second, third and fourth lumbar segments.

The time of incidence and the relative frequency of the atrophy of the different groups of muscles and

ARTHRITIS DEFORMANS

altered reflexes is determined by the area of the capsule and its synovial lining primarily and most frequently affected. Hilton maintained that the ligamentum teres is the most common seat of early disease because of the referred pain in the knee joint so often found in hip-joint affections due to a common nerve supply, but the obturator also sends a branch to the anterior aspect of the hip capsule which would be associated with the same referred pain. Apart from any indication given by pain, we should expect that the anterior part of the capsule, from the constant strain that its physiological function of maintaining extension compels it to sustain, would be more frequently the seat of the incidence of hip disease than the ligamentum teres or the posterior aspect. The anterior nerves of the hip joint are derived from the anterior crural, the obturator, and filaments arising directly from the lumbar plexus, all of which have their centres in the second, third and fourth lumbar segments, so that the distribution of muscular atrophy and relative frequency of the altered reflexes complement each other in indicating the probable incidence and course of the disease. The remaining reflexes as enumerated are found altered in diminishing ratio from above down. In sciatica, and arthritis deformans of the hip, tendon reflexes, when there is any change, are the opposite of each other: in sciatica hypoactivity, in hip arthritis hyperactivity.

In diseases of the hip joint atrophy of the muscles concerned in its movements is usually a noticeable feature; when the origin of the complaint is traumatic it may exist only to a very slight degree. In the infective variety it is early in onset and sometimes extreme in amount. The nerve cells, as the result on them of the toxin of whatsoever nature it may be, are made more readily susceptible to the reflex influence from the irritated joint, and resulting atrophy comes

on earlier and to a much greater extent than in cases of traumatic origin. The rapidity of onset of the atrophy and its extent seems to be determined by the irritant quality of the infection rather than by the extent of the joint disease; it may come on within a very few days of the onset of the complaint, the gluteal region showing great loss of volume, flaccidity, and disappearance of the gluteal fold. Almost invariably in all joint affections this reflex atrophy begins in and remains confined to the extensor group of muscles, is more accentuated in it than in the other groups should they in their turn become implicated, and remains evident in the extensors after the other muscles have apparently recovered their volume and tone.

The selection of the extensor muscles for the primary and more severe manifestations of the atrophy has been attributed to the fact that, as a rule, the nerve supply for an articulation comes from the branch that innervates the extensor muscles. Another explanation that has been given is that the muscular effort and strain on the extensor group are usually greater than on the others. To the hip joint neither of these rules applies: its nerve supply comes from all the nerves and their roots that supply the limb, and the extensor muscular effort is much diminished by the effect of the powerful anterior capsular ligament. The hip joint affords a notable exception to this primary extensor atrophy rule; almost invariably the flexor group, as represented by the psoas and iliacus muscles, is affected primarily.

I wish to draw particular attention to this peculiarity in the distribution of muscular atrophy in affections of the hip joint, as I have not found any reference to it in any of the literature on arthritis of the hip; it is a symptom of value in the early diagnosis of hip disease inasmuch as it is one of the earliest objective signs. It has probably escaped attention because, unlike

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wasting of the extensors and adductors, it is not apparent to the eye of the observer; existing at the very onset of the toxic form of arthritis of the hip, this atrophy and loss of power of the flexors in some cases goes on to such a degree that in advanced stages of the disease the patient may be unable to raise the limb from the bed, or if it be passively flexed, the leg being kept in extension on the thigh to a right angle with the body, there is complete inability to maintain the limb in that position.

For the detection of this early loss of power in the psoas and iliacus the examination must be made with the patient lying flat on his back on the floor or on a board. The hand of the examiner is placed on the lower part of the thigh just above the patella; the patient is then told, whilst keeping the leg extended at the knee joint, to flex the thigh on the abdomen against the resistance of the examining hand. The difference in the power of the flexors on the two sides is usually at once appreciable, both to the examiner and to the patient. If the atrophy and loss of power affect first the flexor muscles, the other groups, especially the extensors and adductors, rapidly follow suit, with consequent disappearance to a remarkable degree of the gluteal mass; but even in the most advanced cases the power of extension does not suffer to the same extent as that of flexion, because extension, as demanded for the maintenance of the upright position, is not so much the result of muscular action as of the mechanical effect of the capsule with its reinforcing anterior ligament. For this reason the loss of extensor power is often not even noticed by the patient. Though the degree of wasting is more noticeable as a rule in the gluteal muscle than in the adductor, the respective times of its appearance in these two is not always clear.

From a pathogenetic point of view one would expect the atrophy of the adductors to follow more closely

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roots. In both there may be atrophy of the same group of muscles in the gluteal region. In both the same initial abnormal position of the limb may exist, namely, slight flexion with slight external rotation. In both there may be (where the funicular portion of the sciatic nerve and plexus is affected) weakness in the action of the *psaos* muscle. But on a close examination differences are found which will enable a positive opinion to be given. If in combination with the above symptoms an exaggeration of the patellar tendon reflex is found, sciatica can be negatived and hip arthritis affirmed.

The enfeebled condition of the *psaos* muscle in sciatica is accompanied with tenderness on pressure through the abdominal walls on the lumbo-sacral cord in that muscle; in disease of the hip this tenderness on pressure does not exist. Such a close correspondence in all the cardinal symptoms as indicated above rarely exists. There are usually differences in the distribution of the pain, and differences in the distribution of the atrophic muscular changes, that enable a decision to be arrived at; also the abnormal attitude above referred to is usually accompanied in hip arthritis with a limitation of range of movement that does not exist in sciatica. The pain in hip disease is not usually limited to the area of distribution of the sciatic nerve, but, either at the beginning of the complaint or as successive areas of the capsule are affected, extends to parts of the limb supplied by the obturator nerve or anterior crural or by both. Such a combination when associated with increased knee-jerk and gluteal or adductor loss of tone or wasting, or *psaos* weakness, affirms hip disease. Chronic or frequently recurring pain in the groin below Poupert's ligament or above it in the regions supplied by the ileo-inguinal or ileo-hypogastric nerves at once suggests hip trouble, and if combined with increased knee-jerk.

that of the flexors, inasmuch as their centres are for the most part in the same spinal segments, namely, the second, third and fourth lumbar. The accessory muscles which play a very secondary part in the movement of adduction, namely, the quadratus femoris and part of the gluteus maximus, derive their supply from nerves having their centres in the fifth lumbar and first and second sacral segments. The sequence in the appearance of the atrophic muscular changes which would be in conformity with that of the altered reflexes, having their centres in the same segments, would be first the flexor group; secondly, the adductor; thirdly, the extensor; and, finally, the abductors. Changes in the muscles affecting internal and external rotation would also be late in their onset.

It has been noticed that the part of the capsule of the hip joint usually primarily affected, that is the anterior aspect, has its nerve supply in connection with the cells of the second, third, and fourth lumbar segments, whilst the later affected posterior part of the capsule derives its nerve supply from the sciatic nerve and sacral plexus, whose centres are found in the fourth and fifth lumbar and the first, second and third sacral segments. So that the chronological order of the onset of the muscular atrophies and altered reflexes is in striking agreement with the successively affected portions of the capsule. An osteo-arthritis or a fibrositis of the capsule where the pathological process has left the synovial membrane untouched has no muscular atrophic symptoms.

A study of the semeiology of sciatica and arthritis deformans of the hip shows its similarity in the two complaints, and how easily the error of mistaking one for the other can be made, more especially of assuming the beginning of a hip affection to be a case of sciatica. For in both the pain may be similar in character and limited to the distribution of the sciatic nerve or its

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roots. In both there may be atrophy of the same group of muscles in the gluteal region. In both the same initial abnormal position of the limb may exist, namely, slight flexion with slight external rotation. In both there may be (where the funicular portion of the sciatic nerve and plexus is affected) weakness in the action of the psoas muscle. But on a close examination differences are found which will enable a positive opinion to be given. If in combination with the above symptoms an exaggeration of the patellar tendon reflex is found, sciatica can be negatived and hip arthritis affirmed.

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and psoas, and adductor or gluteal wasting, positively indicates its existence.

Muscular atrophy limited to the gluteal region never exists in truneular sciatica, and when present in funicular sciatica as a rule affects, in addition to the gluteal muscles, the hamstrings and muscles of the leg. An atrophy limited to the gluteal region combined with increased knee-jerk and weakened psoas muscle justifies the diagnosis of hip disease, even if there be no pain or typical vicious attitude of the limb.

Flexion of the hip with eversion of the foot may exist in both sciatica and hip disease; in the former case as a defensive position against pain, in the latter from mechanical reasons. If this vicious attitude be combined with an increased knee-jerk and loss of muscular tone the hip joint is at fault. In sciatica a further degree of external rotation can be obtained by active or passive effort; in hip disease it is prevented by morbid contraction of that part of the capsular ligament normally limiting external rotation.

The weakness of the psoas muscle diminishing the power of flexion of the thigh upon the abdomen constant in rheumatoid arthritis of the hip, may be absent in osteo-arthritis and in the fibrositic form, and present in sciatic root affections, but in the latter case is accompanied by tenderness on pressure over the psoas muscle through the abdominal wall, and is not accompanied by increased knee-jerk.

The condition of the patellar tendon reflex is of primary importance in the differential diagnosis of the two conditions. Unaltered in sciatica, it is almost invariably increased in arthritis deformans of the hip, constantly in the rheumatoid form, and generally in the osteo-arthritic and fibrositic, though to a less degree; when increased and accompanied by bineural pain, vicious attitude or diminished muscular tone, it justifies the diagnosis of hip disease.

Practical Notes.

The Treatment of Acute Intestinal Obstruction.

W. D. Haggard states that the most dangerous treatment in any acute abdominal condition, and particularly in intestinal obstruction, is purgation. It not only accomplishes nothing, but adds greatly to the œdema and disturbs the commencing necrotic bowel almost to bursting. Enemas are prone to be deceptive; the mere removal of feces in the lower colon and rectum many feet below the point of obstruction does not signify anything unless, perchance, all the symptoms subside, and that is very deceptive, because any action may delude one into the false hope of a so-called through-and-through action and prevent the recognition of the real condition. No improvements, however, in operative procedures or in pre-operative or post-operative treatment will ever make good the harm done by a few hours' delay in the early management. "A timely operation by unskilled hands and under unfavourable conditions will, in the majority of cases, be preferable to a delayed operation, even performed by a surgeon of the greatest skill and experience" (Wilkie). Local anæsthesia is important in intestinal obstruction to prevent drowning by fecal vomiting during the anæsthetic. One of the most important adjuncts to treatment is the administration of sodium chloride solution (1 gram to 1 kilogram) to the amount of 5 litres in 24 hours, 5 per cent. being given intravenously and 2 or 3 per cent. subcutaneously. Thus the depletion of chlorides from the excessive vomiting is counteracted and the alkalosis which chokes the urinary tubules is prevented. The great antidote against dehydration and toxæmia is hypodermoclysis of 3 per cent. salt solution, 3 quarts being administered in 12 hours. With this, many surgeons have materially increased their percentage of cures.—(*Journal of the American Medical Association*, May 5, 1928, p. 1424.)

The Prevention and Treatment of Endemic Goitre.

F. M. Messerli has previously shown that in districts where goitre was endemic the drinking water was nearly always obtained from shallow springs and was always infected, and he produced goitre experimentally in rats by giving them water to drink from a district where goitre was endemic; he produced similar symptoms in rats which drank water infected by human feces. He has come to the conclusion, however, that in addition to the infection of drinking water, which can be prevented by appropriate hygienic measures, intestinal stasis plays an important part in the causation of goitre. He has observed improvement of goitre in patients in whom intestinal stasis was treated by laxatives and abdominal exercises.—(*Revue Médicale de la Suisse Romande*, March 25, 1928, p. 190.)

The Therapeutic Use of Gastric Juice.

J. Rosenthal insists that natural gastric juice prepared by Pavlov's

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PRACTICAL NOTES

use of morphia in the treatment of pulmonary tuberculosis was to allay the distress of frequent unproductive cough. One of the most useful drugs in dealing with the immediate emergency of hæmorrhage was amyl nitrite, which did not depress the cough reflex. There was very little evidence that any of the drugs reputed to produce rapid clotting, such as calcium salts, gelatine and hæmoplastic sera, were of any value in the treatment of hæmoptysis. The blood ought to be expelled, not retained in the lung. In Dr. Carleton's opinion treatment by artificial pneumothorax stood out as pre-eminently useful in preventing hæmoptysis in pulmonary tuberculosis.—(*Bristol Medico-Chirurgical Journal*, Spring, 1928, p. 39.)

Gastric Ulcer and Cancer of the Stomach.

P. Lecène has come to the definite conclusion that it is impossible to tell from macroscopical examination whether or not a gastric ulcer is developing cancerous characteristics, and insists that a histological examination is the only method of proving this. In 63 cases in which he performed gastrectomy for callous ulcers of the stomach, histological examination showed that of 37 non-penetrating ulcers 10 were cancerous, and of 26 penetrating ulcers 5 were cancerous. All of these patients had been examined by X-rays and by the usual clinical methods before operation, and also examined carefully at the operation, without arriving at a definite diagnosis between ulceration and cancer.—(*Bulletin et Mémoires de la Société Nationale de Chirurgie*, March 31, 1928, p. 455.)

The Treatment of Acute Rheumatic Fever by Tonsillectomy.

W. H. Robey, in an effort to prevent heart disease in cases of acute rheumatic fever, has performed tonsillectomy in 75 cases during the time of the joint activity and fever; most of the cases had had sodium salicylate before their entrance to hospital. There was one death—from broncho-pneumonia following profuse hæmorrhage after the operation. Although there were a few failures, Dr. Robey has come to the conclusion that tonsillectomy in these cases does reduce the risk to the heart, ends the acute suffering, and enables the patient to leave hospital and get back to work sooner.—(*New England Journal of Medicine*, May 24, 1928, p. 724.)

Dietetic Treatment in Diabetes.

H. Dennig has studied the effects of the Petréni dietary on 35 diabetic patients. This consists in limiting the consumption of both carbohydrates and proteins as far as possible, the necessary calories being supplied almost entirely by fats. Many patients were kept for six weeks on a diet composed of green vegetables, a little fruit, about 200 grams of butter, and 50 grams of cream per day without any ill effects, and with comparative comfort. Only in the most severe cases did this diet fail to bring the blood sugar down to within normal limits and to render the urine sugar-free. It was not

method is superior in therapeutic value to any of the artificial preparations of pepsin, and supports his opinion by a large number of references to medical literature. He points out that natural gastric juice is particularly of value in the intestinal diseases of infants; but it is also indicated in chronic dyspepsia, disorders of the small and large intestine, enteric fever, and in various conditions where the general condition of the patient may be improved by treatment of the gastro-intestinal tract.—(*Le Bulletin Médicale*, March 14, 1928, p. 317.)

The Treatment of Appendicitis Complicating Pregnancy.

G. I. Miller observes that the symptoms of appendicitis during pregnancy must be differentiated from those of pyelitis, renal colic, ureteral stricture, hydronephrosis, ovarian cyst and ectopic pregnancy. A careful detailed history which shows that there has been a previous attack of appendicitis settles the diagnosis, when coupled with a report that examination of the urine shows no abnormal ingredients. When time permits the ureters may be catheterized and an X-ray photograph taken. Blood examination is not of much assistance. In operating on a pregnant woman for appendicitis the surgeon should confine himself to the appendix only and avoid handling or even touching the uterus and adnexa. A right gridiron incision with separation of the muscular fibres should be the method of entry of choice. Dr. Miller has operated on 59 cases of appendicitis complicating pregnancy from 1907 to 1927 without any maternal death.—(*Medical Journal and Record* [New York], May 16, 1928, p. 552.)

The Late Treatment of Burns.

F. W. Bancroft and C. S. Rogers state that they had previously come to the conclusion that treatment with tannic acid excelled other known methods in the immediate treatment of cutaneous burns, but there are some important points to be observed in the late treatment of burns, even when they have been treated with tannic acid. The splinting of the granulation tissue by the rigid tannic acid membrane while epithelization is in progress seems to prevent contractions of the scar tissue. Infection, however, frequently occurs beneath the tanned membrane, and in such cases the eschar should be debrided and the underlying cellulitis treated. Acriflavine, 1 in 5,000, applied as a wet dressing, tends to diminish infection and apparently aids the epithelization. In deep third-degree burns, it is advisable to apply skin grafts soon after the sloughs separate. When granulating areas have been infected and there has been a delay before grafting is attempted, it is advisable to excise the scar tissue down to the underlying fascia. Pinch grafts immediately applied are usually successful.—(*Archives of Surgery*, May, 1928, p. 979.)

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Preparations, Inventions, Etc.

BEMAX.

(London: Vitamins (1928), Ltd., 38, Danemere Street, S.W.15.)

It has long been known to medical practitioners that certain diseases were associated with diet, but it is only within the past fifteen years or so that the real significance of this has been realized and the existence of hitherto unknown "accessory food factors" recognized. These unknown food constituents were first divided into two groups, called fat soluble A, and water soluble B, both groups being essential to healthy life. The term vitamin was first applied to the unknown substance which prevented the Eastern disease beri-beri (a disease affecting chiefly the nervous system). This substance, which was found in seeds and particularly in the germ of seeds, had a similar distribution in nature to the so-called water soluble B, and was believed to be identical with it. For this reason the word vitamin was associated with water soluble B; and the fat soluble A, to bring it into line, was given the name of vitamin-A. Recent work has shown that vitamin-B is much more important than a mere preventive of an Eastern disease. The symptoms produced in man by deficiency in this vitamin in one form may comprise paralysis and great wasting of the limbs, and in another form may include œdema of the lower limbs or even of the trunk; the thyroid, spleen, pancreas, kidneys and reproductive organs diminish in weight and the adrenals increase in size. These are advanced symptoms, but early symptoms include loss of appetite, lack of vigour, gastro-intestinal derangements, anæmia and loss of weight. Certain researches have recently been conducted on the effects of vitamin-B deficiency in rats, and the results are most interesting as showing particularly the pathological effect on the cæcum and colon, as well as on other portions of the digestive tract, of an absence of vitamin-B. Obviously, then, vitamin-B is a most important food constituent and its deficiency in the dietary is a serious matter. We welcome, therefore, the appearance on the market of a preparation of concentrated vitamin-B in a handy and palatable form, as is Bemax. We consider Bemax an addition of definite value to the dietetic resources of the profession.

SWIMEEZI BATHING COSTUME.

(London: "Swimeezi," Ltd., Roxburghe House, 273-287, Regent Street, W.1.)

The "Swimeezi" bathing costume has been invented by Dr. M. W. Browdy, of Harley Street, W., as an effort to overcome the numerous calamities which occur each year in bathing at the seaside. The invention appears to us to be an eminently practical one, well suited to carry out the intention of the inventor. The costume has the appearance of an ordinary bathing costume, but contains an inflatable, removable, rubber air-chamber, which has been

considered necessary to bring the blood sugar down to below 12 per cent. Patients in whom it was reduced further by the aid of insulin felt no better than those in whom it was left at the higher level. From the basal diet carbohydrates and proteins were added only slowly, and were kept at a minimum. Dr. Dennig considers that this dietetic form of treatment is preferable, whenever practicable, to the continued use of insulin, which necessitates a constant watchfulness for symptoms of hypoglycæmia.—(*Münchener Medizinische Wochenschrift*, May 25, 1928, p. 891.)

The Influence of Vitamin-D on the Healing of Fractures.

I. G. Knoslach has found that ergosterol containing vitamin-D in large quantities has a beneficial effect on the healing of fractures of the long bones. This was especially noticeable in cases in which the fractures were in elderly people over the age of fifty-five. In them the actual time of complete union of the bone was reduced, but in all patients treated with vitamin-D an increase in the amount and density of callus was observed, the observation being confirmed by comparison with controls having similar fractures but untreated with the vitamin. Increase in the calcification of the callus usually began in the third week from commencement of treatment, and was particularly striking in old people and in children.—(*Wiener Klinische Wochenschrift*, May 24, 1928, p. 739.)

The Injection of Milk in Infections of the Eye.

E. Bachstetz describes several infective conditions of the eye in which he has obtained good results from the intramuscular injection of milk. In gonorrhœal conjunctivitis in adults, even after one injection of 6 to 8 c.cm. there was remarkable diminution of swelling and of the purulent discharge, whilst within a few days there was a total disappearance of gonococci from the discharge. Dr. Bachstetz does not recommend this treatment for ophthalmia neonatorum, however. In iritis, both of the gonorrhœal and rheumatic variety, the milk injections were found to be a valuable adjunct to local therapy. Injected in the early stages of an attack the pain and inflammation quickly subside. Threatened or already existing infection of the contents of the eyeball form another indication for this therapy, as, for example, penetrating wounds of the eye or prior to operation for the extraction of a foreign body. In these cases a single injection suffices. Dr. Bachstetz uses fresh cows' milk heated to between 38° and 40° C. At this temperature it is usually tolerated with comfort, and it was found by experience that the higher the temperature of the milk, the better was the result obtained. A small rise of temperature may occur after the first injection. If this should happen the next injection is given two days after the first, otherwise on the following day.—(*Wiener Klinische Wochenschrift*, May 10, 1928, p. 671.)

Preparations, Inventions, Etc.

BEMAX.

(London: Vitamins (1928), Ltd., 38, Danemere Street, S.W.15.)

It has long been known to medical practitioners that certain diseases were associated with diet, but it is only within the past fifteen years or so that the real significance of this has been realized and the existence of hitherto unknown "accessory food factors" recognized. These unknown food constituents were first divided into two groups, called fat soluble A, and water soluble B, both groups being essential to healthy life. The term vitamin was first applied to the unknown substance which prevented the Eastern disease beri-beri (a disease affecting chiefly the nervous system). This substance, which was found in seeds and particularly in the germ of seeds, had a similar distribution in nature to the so-called water soluble B, and was believed to be identical with it. For this reason the word vitamin was associated with water soluble B; and the fat soluble A, to bring it into line, was given the name of vitamin-A. Recent work has shown that vitamin-B is much more important than a mere preventive of an Eastern disease. The symptoms produced in man by deficiency in this vitamin in one form may comprise paralysis and great wasting of the limbs, and in another form may include oedema of the lower limbs or even of the trunk; the thyroid, spleen, pancreas, kidneys and reproductive organs diminish in weight and the adrenals increase in size. These are advanced symptoms, but early symptoms include loss of appetite, lack of vigour, gastro-intestinal derangements, anaemia and loss of weight. Certain researches have recently been conducted on the effects of vitamin-B deficiency in rats, and the results are most interesting as showing particularly the pathological effect on the caecum and colon, as well as on other portions of the digestive tract, of an absence of vitamin-B. Obviously, then, vitamin-B is a most important food constituent and its deficiency in the dietary is a serious matter. We welcome, therefore, the appearance on the market of a preparation of concentrated vitamin-B in a handy and palatable form, as is Bemax. We consider Bemax an addition of definite value to the dietetic resources of the profession.

SWIMEEZI BATHING COSTUME.

(London: "Swimeezi," Ltd., Roxburghe House, 273-287, Regent Street, W.1.)

The "Swimeezi" bathing costume has been invented by Dr. M. W. Browdy, of Harley Street, W., as an effort to overcome the numerous calamities which occur each year in bathing at the seaside. The invention appears to us to be an eminently practical one, well suited to carry out the intention of the inventor. The costume has the appearance of an ordinary bathing costume, but contains an inflatable, removable, rubber air-chamber, which has been

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considered necessary to bring the blood sugar down to below 12 per cent. Patients in whom it was reduced further by the aid of insulin felt no better than those in whom it was left at the higher level. From the basal diet carbohydrates and proteins were added only slowly, and were kept at a minimum. Dr. Dennig considers that this dietetic form of treatment is preferable, whenever practicable, to the continued use of insulin, which necessitates a constant watchfulness for symptoms of hypoglycaemia.—(*Münchener Medizinische Wochenschrift*, May 25, 1928, p. 891.)

The Influence of Vitamin-D on the Healing of Fractures.

I. G. Knoflach has found that ergosterol containing vitamin-D in large quantities has a beneficial effect on the healing of fractures of the long bones. This was especially noticeable in cases in which the fractures were in elderly people over the age of fifty-five. In them the actual time of complete union of the bone was reduced, but in all patients treated with vitamin-D an increase in the amount and density of callus was observed, the observation being confirmed by comparison with controls having similar fractures but untreated with the vitamin. Increase in the calcification of the callus usually began in the third week from commencement of treatment, and was particularly striking in old people and in children.—(*Wiener Klinische Wochenschrift*, May 24, 1928, p. 739.)

The Injection of Milk in Infections of the Eye.

E. Bachstet describes several infective conditions of the eye in which he has obtained good results from the intramuscular injection of milk. In gonorrhoeal conjunctivitis in adults, even after one injection of 6 to 8 c.cm. there was remarkable diminution of swelling and of the purulent discharge, whilst within a few days there was a total disappearance of gonococci from the discharge. Dr. Bachstet does not recommend this treatment for ophthalmia neonatorum, however. In iritis, both of the gonorrhoeal and rheumatic variety, the milk injections were found to be a valuable adjunct to local therapy. Injected in the early stages of an attack the pain and inflammation quickly subside. Threatened or already existing infection of the contents of the eyeball form another indication for this therapy, as, for example, penetrating wounds of the eye or prior to operation for the extraction of a foreign body. In these cases a single injection suffices. Dr. Bachstet uses fresh cows' milk heated to between 38° and 40° C. At this temperature it is usually tolerated with comfort, and it was found by experience that the higher the temperature of the milk, the better was the result obtained. A small rise of temperature may occur after the first injection. If this should happen the next injection is given two days after the first, otherwise on the following day.—(*Wiener Klinische Wochenschrift*, May 10, 1928, p. 671.)

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SEPTEMBER

1928

Cancer of the Stomach.

BY SIR BERKELEY MOYNIHAN, BART., K.C.M.G., C.B.,
M.S., F.R.C.S.

President of the Royal College of Surgeons ; Emeritus Professor of Surgery, University of Leeds ; Consulting Surgeon, Leeds General Infirmary, etc.

CANCER of the stomach is not often cured. The disease can be removed, and recrudescence prevented, only by surgical treatment. The limits of surgical removal have now been reached, for the whole organ has been extirpated, together with the lymphatic glands attached to it. No further extension of operative methods is possible. The conclusion, therefore, is inevitable that it is to the earlier recognition of the disease that we must now direct attention. The problem, that is to say, is here the same as it is elsewhere : to discover the earliest signs and symptoms of various diseases, so that medical or surgical treatment may arrest their course, and, perhaps, disclose to us the clue to their origins, and enable us at last to prevent their incidence.

It is with cancer of the stomach as with so many other diseases. The symptoms described in our textbooks are those of well-established disease, of organic changes already so firmly rooted that eradication is

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designed to be maintained in a definite anatomical position; it has a special valve to allow for easy inflation and deflation. It is made in various sizes, for children, women and men.

EUKODAL.

(London: Messrs. H. R. Napp, Ltd., 3 and 4, Clements Inn, Kingsway, W.C.2.)

Eukodal, or dihydroxy-codeinon hydrochloride, is a narcotic and analgesic, which is a useful substitute for morphine and is not subject to the Dangerous Drugs Acts. It is readily soluble in water, and solutions are sterilizable and not liable to decomposition. It has a central narcotic effect, resembling that of morphine, but is rather more rapid in action besides being less toxic. One of its most important advantages is that it is non-habit forming, and its employment may be discontinued without difficulty, while vomiting and other ill-effects have not been observed in connection with its continued employment.

TRINITRINE CAFÉINÉE.

(London: The Anglo-French Drug Co., Ltd., 283a, Gray's Inn Road, W.C.1.)

Trinitrine Caféinée (Dubois) is a preparation consisting of soft-centred sugar-coated pills, each containing 3 centigrams of trinitrin (1 per cent. solution) and 2 centigrams of pure caffeine; the caffeine, the addition of which to trinitrin is recommended by Professor Vaquez, apparently prolongs the action of the trinitrin and counteracts the cardiac weakness that follows an anginal attack. These pills are quickly absorbed when they are masticated, and are calculated to have a rapid therapeutic action in cases of angina pectoris and cardiac asthma. The dose is one to three pills, masticated at intervals of a few minutes to ward off or to treat an attack, with a maximum of ten pills in 24 hours.

ATOPHAN BALSAM.

(London: Messrs. Schering, Ltd., 3, Lloyd's Avenue, E.C.3.)

Atophan Balsam is an ointment containing atophan amylester 10 per cent., phenyl salicylate 10 per cent. and camphor 5 per cent. It is indicated as an external application in the treatment of rheumatism, gout, neuritis, neuralgia, synovitis, chilblains, etc., and is an effective adjuvant to the employment of atophan internally. We have found that the balsam is absorbed remarkably rapidly when it is massaged into the skin, and it relieves pain quickly.

HÆMOGLOBIN CHART.

(London: Messrs. Coates and Cooper, 41, Great Tower Street, E.C.3.)

A handy little hæmoglobin chart has been prepared by Messrs. Reed and Carnrick, of Jersey City, U.S.A., a few specimens of which will be sent free by Messrs. Coates and Cooper to any member of the profession mentioning THE PRACTITIONER. The chart consists of a parti-coloured disc surrounded by a larger disc of blotting-paper; a drop of blood is placed on the blotting-paper and this is rotated until the colour is matched, the percentage being then read off.

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It is with cancer of the stomach as with so many other diseases. The symptoms described in our textbooks are those of well-established disease, of organic changes already so firmly rooted that eradication is

difficult, uncertain or impossible. Our textbooks are written as a rule by physicians or surgeons attached to teaching hospitals, by individuals to whom patients obtain access only when symptoms are so advanced as to need institutional treatment. Such physicians, even in their private work, act chiefly, even if not exclusively, in a consultative capacity. The inaugural stages of disease have passed, therefore, before appeal is made to final authority. I have tried, so far unhappily in vain, to persuade some of my very competent friends in general practice to write a textbook dealing with the meaning, development and interpretation of early symptoms. From such a source I think much needed knowledge might come.

For the purposes of this article I have reviewed the histories of the last 100 cases of cancer of the stomach sent to me for treatment. The diversity of symptoms is very striking. In reading the histories one after another, it is difficult to believe that they always relate to patients suffering from the same disease. One is driven to the conclusion that the disease has varieties so widely different one from another in respect of symptoms that corresponding difference in the structural changes revealed to the pathologist might be expected.

In some the disease is ushered in abruptly, proceeds rapidly, and within a very few weeks is found to be beyond the reach of the most resolute surgeon. In others trivial symptoms, of a kind experienced before, seem almost to disappear after treatment, to recur weeks or months or even a year later, only then to excite surprise or reluctant suspicion. To account for such striking diversities, I think it is not rash to prophesy that tissue culture may show us widely different modes of cell propagation in this disease and that factors are at work of which at present we know nothing.

CANCER OF THE STOMACH

The following clinical types appear in my series:—

1. That in which there is a mimicry of the symptoms of duodenal ulcer. These symptoms I was the first to describe a quarter of a century ago. They are now regarded as "classical," and I need not repeat them here. The only difference, and it is extremely significant, is the absence of "intervals." In the typical case of duodenal ulcer, "attacks" of pain alternate with "intervals" of freedom. The attacks are seasonal in incidence and appear to be provoked by cold, overwork, worry or serious anxiety. I once wrote that the "intervals" were of cardinal importance, were as significant as the "attacks," in order to emphasize the point that an unbroken continuity in the symptoms does not indicate the existence of a chronic duodenal ulcer, but of some other disease. In cases of duodenal ulcer the symptoms are easily and quickly relieved by appropriate treatment. If the symptoms are unrelieved the case is not unlikely to be one of carcinoma of the stomach. The importance of this observation is considerable, for the type of carcinoma then present is among the most serious. Even in operations undertaken very early, when consent to surgical treatment was given almost reluctantly because of the brief period of symptoms, I have often found that the disease had already progressed too far to allow of a reasonable hope of permanent relief after its local removal. The routine examination of the stools for blood, and the radiologist's report, are invaluable. The lesson we learn from these cases is this: that if the symptoms of duodenal ulcer appear for the first time in a man of middle age, are at once "classical," but do not improve under treatment, no "interval" occurring, grave suspicion of malignancy must be entertained.

2. That in which the symptoms are those of "dys-

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2. That in which the symptoms are those of "dys-

pepsia." The symptoms are not severe, do not at once create anxiety in the mind of the patient, and are often ameliorated if not temporarily remitted by medical treatment. The symptoms are anorexia, loss of appetite for all the heavier foods, at times a positive repulsion in regard to some. The older physicians spoke of a dislike of meat and of fats, and this is recorded in several of my cases. There are epigastric discomfort, heaviness, flatulence, belching which gives relief, regurgitation of a little food which tastes bitter or acid, an unpleasant or even offensive taste when gas or fluid is returned. The general health fails, anæmia is noticed, loss of weight sets steadily in, and on examination of the abdomen a tumour may be felt. Vomiting is often delayed, either because the amount of food desired and taken is small or because the patient realizes that less and less food must be taken if it is to be retained, and he seems for a time at least to be able to gauge the retentive capacity of his stomach. When vomiting occurs, blood may be mixed in varying quantities with the ejected contents. Pain throughout is subdued; it is rarely as severe as in cases of simple ulceration, and even in terminal stages may never be severe or seriously excited by food. In a certain number of cases appetite may be retained and food desired and enjoyed. After an exploratory operation has shown an extensive and irremediable condition of carcinoma of the stomach, with numerous secondary deposits in glands, liver, omentum, pelvis and peritoneum, I have often been amazed to see the patient asking for and enjoying as good a meal as any other patient in the nursing home.

3. In this group the symptoms of obstruction appear early; perhaps before all others. The obstruction may be at the cardia, in the body of the stomach or at the pylorus. Dysphagia is an unusual but important

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symptom. It may be due perhaps to spasm (? protective) in the lower part of the œsophagus, to a growth involving the cardiac end of the stomach chiefly or exclusively, or to the insidious but unrelenting development of a "leather-bottle stomach." An obstruction in the body of the stomach or near the pylorus causes dilatation and hypertrophy of the stomach behind it; the dilatation may sometimes be very considerable and vigorous waves of contraction "in sequent toil all forwards do contend." Vomiting is then frequent or profuse. The insidious nature of carcinoma of the stomach is exemplified by such cases as these, in which, even when the growth is extensive and perhaps diffused beyond the stomach, no symptoms are present other than those caused by mechanical hindrance to the passage of food.

4. Hæmorrhage is sometimes the first symptom. In this series there were seven patients who noticed little or nothing wrong until vomiting occurred; blood came towards the end of the act as a rule, but in two cases nothing but blood was observed and the discharge in both was copious and caused faintness. Anæmia develops very rapidly in such cases and seems out of all proportion to the obvious amount of blood discharged. The red cell count may fall to 3 million very quickly and the Hb content to 50 per cent. When anæmia develops quickly the appearances are those of pernicious anæmia. In a surprisingly large number of instances I have had patients suffering from "carcinoma of the stomach" referred to me and have found them to be afflicted with pernicious anæmia. One such patient came many thousand miles for operation. In others, again, "pernicious anæmia" has been diagnosed and treated for months, the patient suffering from a growth in the stomach or in the ascending colon. It is remarkable that a malignant tumour in

either of these situations should produce such profound anæmia. The new and extraordinarily efficient treatment of pernicious anæmia, introduced by Minot and Murphy, is not only of therapeutic but also of diagnostic value; for other forms of anæmia, those of a "secondary" character, seem far less, if at all, affected by it.

The differential diagnosis between pernicious anæmia and carcinoma is certain to be far easier in the future. A point of resemblance between the two diseases is revealed by a chemical examination of the stomach contents. In the former free HCl is invariably absent; in the latter not infrequently. The absence in both may be congenital. The acid antiseptic barrier being removed, the stomach does not inhibit bacterial growth as well as it should. It is more likely that carcinoma develops because of the absence of free HCl than that the development of the growth or the presence of sclerosing gastritis destroys the acid-producing cells in the mucosa. The acid deficiency, in other words, is a precursor of carcinoma, a contributory cause rather than a result. The sufferer from congenital achlorhydria falls an easy victim to both diseases, carcinoma and pernicious anæmia. Rarely a confident diagnosis of pyloric obstruction due to malignant disease may be made from the Reyzuss chart alone, the complete absence of free HCl being shown with a very high lactic acid curve.

It is evident from this brief analysis that no single description can include all cases of gastric carcinoma. The symptoms of the disease are so multiform, the duration so uncertain, that some attempt at discrimination must be made. We may describe cases as acute and chronic. The acute cases are ushered in with a suddenness that is sometimes dramatic; their development is rapid, the anæmia and the wasting progress unremitting, and all is over well within the short space of one year. The chronic cases are insidious. The

patients may be, and in my experience not seldom are, the victims of an old "dyspepsia." Very little concern is expressed either by the patient or the medical man at the slow progress of disease. Periods of temporary improvement may follow a change of scene, or a modified dietary. A year or two or even three may elapse before a serious view is taken of the condition; and even then the surgeon may be able to relieve his patient, it may be permanently, by a wide resection of the tumour. I feel confident that some day the pathologists will tell us the reasons for this almost incredible difference in the various types of disease. Such differences raise the question as to the implantation of carcinoma upon an older lesion, a chronic simple ulcer. That this tragic event does occur there is not the slightest doubt; but quite inexplicable differences of opinion exist with regard to its frequency. The evidence is twofold: pathological and clinical.

The pathological evidence is a matter of controversy between expert pathologists, and into such company a surgeon will fear to intrude. I may, very humbly, suggest that their methods are perhaps not yet adequate to settle the matter; and that tissue culture or tissue respiration may be able to show such variations in cell growth as to furnish some explanation of the painful discrepancies in opinion.

Professor M. J. Stewart, upon whom I am well content to rely, gives the following figures.¹ Of 260 stomachs, 163 showed chronic ulceration only, 80 showed cancer, and 17 cancer developed from ulcer. That is to say, 9·4 per cent. of cases of chronic ulcer had become malignant, or, in other words, 17·5 per cent. of cases of cancer originate in chronic ulcer.

In 1909, Wilson and MacCarty of Rochester, Minn.,² published a report on 218 specimens of resection of the stomach. In 47 of these simple ulcers were found. "Of the 158 cases remaining, 5 were ulcers with

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suspicious aberrant epithelial proliferation, and were labelled 'doubtful.' Of 153 cases of undoubted cancer left, 109 (71 per cent.) gave enough gross and microscopic evidence of previous ulcer to warrant labelling them 'cancer developing on ulcer.' In 11 other cases (7 per cent.) there was considerable evidence of preceding ulcer, but not enough to warrant placing them in the former group. In only 22 per cent. was there little or no pathological evidence of preceding ulcer." And in 1914, Wilson and McDowell³ wrote: "It seems probable that gastric cancer rarely develops except at the site of a previous ulceration of the mucosa."

Over against this, my friend Mr. John Morley, of Manchester, writes:⁴ "While one cannot deny the possibility of cancer developing in the edge of a chronic gastric ulcer, or in some part of a stomach that is or has been afflicted by a chronic gastric ulcer, this investigation provides no evidence that the development of cancer on gastric ulcer occurs with anything like the frequency claimed by some authorities. The evidence set forth in this paper points to the conclusion that a patient with a chronic simple ulcer of the stomach is little, if at all, more liable to cancer than a healthy individual."

A very interesting paper by Dr. Dible⁵ supports Mr. Morley's contention as to the infrequent incidence of cancer in cases of chronic ulcer. Balfour, in two interesting papers,^{6 and 7} discusses the expectancy of life in patients who have been operated upon for chronic gastric ulcer. One of his relevant conclusions is that "the most important single factor influencing the life expectancy of patients operated upon for gastric ulcer is gastric cancer."

Our specimens of gastrectomy show beyond cavil that the change from a simple to a malignant ulcer does in truth take place. It must be remembered that the specimens sent to the pathologist are not often such as he would desire. He seeks the early cases.

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As I have shown, the early cases are sought by the surgeon also, but almost never come his way. He captures the specimens of *ulcus carcinomatosum* not when operating for cancer, but when dealing with ulcer. By the time the malignant case reaches the operation table the evidence, if it ever existed, is perhaps destroyed; not all the palimpsests can be deciphered. The clinical evidence is often disallowed, or held to be of minor importance. Clinical work in the modern fashion is often disparaged by comparison with laboratory work. There is no conflict between the two. Clinical evidences rightly acquired and honestly assessed can stand any test with a success not inferior to that of other methods. The clinical evidence in favour of the implantation of a malignant disease upon a simple one is impregnable. In my earlier experience it was evident that a history of dyspepsia had existed for many years in approximately two cases in three. In my last hundred cases submitted to review there have been so large a number of the "acute" cases that the proportion is changed. There have been only 43 cases in which a history of chronic recurrent dyspepsia was elicited. Such variations in small selected groups of cases are to be expected. They do not invalidate the strength of evidence in individual cases, but illustrate only the difficulty in arriving at an average.

Two illustrations may be given :—

ACUTE CASE.

A great friend of mine, whom I had known for over thirty years, began suddenly and for the first time to suffer from epigastric pain. He remembered not only the day upon which the pain appeared, but the meal upon which it followed. It was after lunch on August 20. No repetition of variously phrased questions could induce him to alter this perfectly definite statement. From August 20 his discomforts, distensions, pain, heartburning and food regurgitations, anæmia, loss of weight, progressed. I saw

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him on the following October 1 in the late afternoon, and found a tumour in the epigastrium. After preparation I operated upon him on October 3. He had a very extensive growth in the stomach, extending along the lesser curvature for almost its whole length; there were "sago grains" on the whole stomach, many glands along the coronary artery up to the aorta, secondary growths in the liver and a tiny dropped growth in the pelvis. I was unable to do anything beyond "exploration"; I removed one sago grain and one gland; their examination confirmed the diagnosis of carcinoma. After the operation great improvement was noticed; and nine months later his medical man wrote to ask if I could be sure of the diagnosis as the patient had returned to full work, felt very well and thoroughly enjoyed his food. He died in October, on St. Luke's Day, a year after operation. This case illustrates not only the silence of the symptoms and the amazing rapidity of the development of the growth, but also the remarkable improvement which follows not infrequently (it is, indeed, to be expected) after the abdomen has been opened.

CHRONIC CASE.

The chronic type is illustrated by the case of a man who, at the age of 61, consulted me. When 38 years of age he had retired from business because of recurring severe dyspepsia. He had found that leisure, a light diet and a sunny climate made life tolerable. Work in the bleak climate of the north caused him much suffering. His history was, in my opinion, a typical one of "gastric ulcer." The last attack had suffered no diminution in severity, in spite of treatment, for nearly two years. I operated and removed a large growth from the stomach. There was no evidence of chronic ulceration, only a large ulcerous growth, with a sloughing offensive base and tumid dense masses at the circumference. There was no recognizable cause for the long dyspepsia; and unhappily the stomach had not been examined by a radiologist before I saw the patient. But there is little doubt that a chronic ulcer had been present.

If the symptoms are then so multiform, and therefore so misleading, that the sufferers from this disease do not seek or obtain relief in the curable stage of their disease, what is to be done?

In the first place, the truth must be emphasized that cancer here and everywhere is at first a local disease and that if it is removable a cure of the condition is possible. Not a little of the incredulity of patients and the apathy of medical men is based upon the widespread conviction that cancer of the stomach is

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incurable. It is incurable only when the disease is so situated as to be inaccessible, or so widespread that though the primary growth could be excised satellite growths are already present. In the second place, it must be realized that certainty of diagnosis means improbability of cure. There are no symptoms pathognomonic of carcinoma in any of its stages: the symptoms are only suggestive, not conclusive. When these symptoms appear in people of thirty-five or over the case is not one for treatment, but for investigation. The success of medical treatment in early cases of cancer of the stomach is one of the causes of the very high mortality of the disease. When carcinoma is present, a restriction of diet, a change of scene and the administration of drugs will bring a measure of relief for a short time. It is not relief that is wanted. It is knowledge. We should seek not to subdue symptoms, but to evoke them.

To treat this form of dyspepsia without the fullest inquiry is not justifiable. Our duty here is not to cause subsidence of symptoms to delude the patients and ourselves, but to set to work at once with eager investigation. The main inquiry really centres upon the radiologist. He alone, and not always even he, is able to make the diagnosis in the early stages. It is for the radiologists to tell us upon what they rely. The early infiltration of muscle which the pathologist recognizes means an interruption in the peristaltic wave at the affected point: fixity of the lesser curvature, indentations, filling defects and so forth are observed. The radiologist is not infallible; but his approach to accuracy is far greater than that of the clinical physician.

In the rare cases where the radiologist may be in doubt as to the presence of a growth, or as to the nature of the organic change undoubtedly observed, it is for the surgeon to decide by an inspection of the

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parts. Intemperate "exploration" is to be condemned. Only after fullest, most earnest and repeated inquiry is such a procedure to be followed. But when it is necessary it must be accepted.

The clinical history, therefore, must be regarded as only suggestive. Examinations by the radiologist, and by the chemist for free HCl in the stomach contents and for blood in the fæces, must be insisted upon if we are to improve the present lamentable condition of things in regard to the surgical treatment of gastric carcinoma.

References.

- ¹ *Journal of Pathology and Bacteriology*, 1926, vol. xxix, p. 321.
- ² *American Journal of Medical Science*, 1909, vol. cxxxviii, p. 846.
- ³ *Ibid.*, 1914, vol. cxlviii, p. 796.
- ⁴ *Lancet*, 1923, vol. ii, p. 823.
- ⁵ *British Journal of Surgery*, 1924-5, vol. xii, p. 666.
- ⁶ *Annals of Surgery*, 1919, vol. lxx, p. 522.
- ⁷ *Ibid.*, 1922, vol lxxvi, p. 405.

The Prevention and Treatment of Tuberculosis by an Immunizing Vaccine.

By NATHAN RAW, CM.G., M.D., F.R.C.S., F.R.S.E.

Lord Chancellor's Visitor

THE medical practitioner is always deeply concerned when he is asked to undertake the treatment of a patient suffering from tuberculosis. He knows that, if the disease is not arrested in the early stages, it will progress with certainty to a fatal termination. In spite of an enormous amount of research going on in all parts of the world, we have reluctantly to admit that we have not yet obtained a specific remedy which will effectively destroy all the tubercle bacilli in the body without serious risk to the patient. We must therefore rely on producing a sufficient immunity in the tissues to resist the attack of virulent tubercle bacilli. This immunity can be obtained:—

(1) By increasing the natural resistance by means of increased nutrition and sound hygienic conditions.

(2) By producing an artificial active immunity in the tissues to the tubercle bacillus. It is to the latter (the production of active immunity) that I wish to direct the attention of the profession.

In considering this problem it is vital to appreciate the exact method by which the bacilli gain entrance to the human body, and, above all, the various types of bacilli which may affect it. The three principal types are as follows:—

(1) *Typus humanus*.

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disease he must be able to resist a virulent dose of the living organisms of the disease itself. This may be true in the laboratory, but it does not apply in practice. It is not necessary to produce *complete* immunity, as a *partial* active immunity is all that is necessary in the treatment and prevention of an infection in its early stages. We have a good example of this in anti-typhoid inoculation and in anti-tetanic serum, the wonderful effects of which I observed in the war. The immunity conferred was sufficient to deal with an early infection, and so prevent its spread and development in the body. It is not necessary either to use living cultures, as killed cultures of typhoid and para-typhoid are quite adequate and successful. In most of the acute infectious diseases one attack confers an immunity to the patient for the rest of his life. This is not so in dealing with tuberculosis.

A person who has had pulmonary tuberculosis is always liable to a recurrence, even twenty years after a complete arrest. This is not observed to the same extent in cases of bovine lesions, and patients who have recovered from glands, bone and joint lesions rarely have a recurrence and often live to old age. It is for this reason that in attempting to produce an active immunity we must use a vaccine prepared from killed cultures of the opposite strain.

For example, a case of pulmonary tuberculosis which is of the human type must be treated with a vaccine prepared from bovine bacilli, and *vice versa*.

Professor Calmette always uses a living bovine culture which has been attenuated to the extent of making the bacilli non-pathogenic. I personally never use living cultures, being quite satisfied in my results with killed bacilli.

PREPARATION OF VACCINE

The vaccine is prepared from cultures which have

(2) *Typus bovinus*.

(3) Avian type.

In 1903 I published a paper, the gist of which was that human and bovine tuberculosis were separate and distinct infections, producing a different set of symptoms in the human body, and that they were probably antagonistic to each other.

The *human* type produces the greatest and most serious amount of tuberculosis in the form of pulmonary disease, popularly called consumption; it also causes tuberculous laryngitis, secondary intestinal ulceration, and, in some cases, lupus.

The *bovine* type of bacillus is introduced into the body through the alimentary tract in the form of infected milk, cheese, butter and dairy products, the infection usually being in very early life.

The *avian* type affects chickens and birds, which, in their turn, affect pigs in large numbers. This type is not pathogenic to man, and so we may disregard it.

A child affected with bovine bacilli may develop tuberculous glands, usually in the neck, mesenteric disease, affections of bones and joints, meningitis and lupus. Fortunately, these bovine lesions, if treated in the early stages, tend to natural cure, and do not seriously affect the general health afterwards.

The important point I wish to make is that these bovine affections undoubtedly confer an immunity against the more serious lesions caused by the human type, and in my experience a child who has recovered from glands and other bovine lesions is not so susceptible to pulmonary tuberculosis, and *vice versa*.

The two infections will not live in the human body at the same time. It is on this principle that I advocate the production of an active immunity in the prevention and treatment of the disease.

It has generally been held by pathologists that before a person can be considered immune to an infectious

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if given in correct and graduated doses.

In early infections, the vaccine seems to produce sufficient active immunity to enable the tissues to produce sufficient anti-body to deal with the infection, and, what is of greater importance, to limit the spread of the disease in the organ affected. During the last five years I have very carefully observed several cases in hospital in which the lesion was confined to one apex of the lung, bacilli being present in the sputum in every case. In most of the cases the disease has remained localized and arrested, showing no tendency to progress, a course of twelve injections being given every six months. I hope to report the final results of these selected cases in *THE PRACTITIONER* at a later date. The protection of the community by some safe scientific method of active immunization is the only effective way in which this preventable scourge can be eradicated.

The medical profession has, during the last few years, been losing their confidence in the specific treatment of tuberculosis by the various preparations of tuberculin. This can be accounted for by the fact that many of the tubereulins were prepared from virulent cultures which caused serious reactions and undoubtedly irritated the focus of infection. In my own experience it is not necessary to produce a reaction in the form of high temperature to achieve immunity. The vaccine should be prepared from cultures which have been deprived of their virulence and toxicity, and prepared from the opposite strains of tubercle bacilli. A case of pulmonary tuberculosis should be treated by a vaccine prepared from bovine bacilli, and a case of surgical tuberculosis by a vaccine prepared from human bacilli. The dosage should be carefully graduated, and a course for treatment should consist of twelve weekly injections, the maximum dose being 0.01 mg. In no case are any reactions produced.

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been continuously subcultured on glycerine-agar medium every month in my laboratory for the last 22 years. The present cultures are of the 262nd generation. This long process has deprived the cultures of their virulence and they are now so attenuated as to be quite non-pathogenic and non-tuberculigenic to animals. The cultures are all sterilized by heat before the vaccine is made. Being deprived of its virulence and toxicity, the vaccine produces no reactions, and can be given in much larger doses and with perfect safety.

IMMUNITY

With the object of preventing tuberculosis in dairy cows and thereby reducing the surgical tuberculosis in children caused by infected milk, I have been engaged during the last five years in immunizing calves shortly after birth, by giving them two injections of vaccine from human bacilli. The first one week after birth, and the second one week later. This has been done by competent veterinary surgeons, and we have records of over 2,200 calves. The results are excellent, and the immunity is at least over two years and probably longer. I look forward with great confidence to this method of attack, as, in my opinion, if we can eradicate the disease from dairy cows, we will to a great extent eliminate surgical tuberculosis from children.

TREATMENT OF EARLY CASES

From a very large experience in the treatment of patients suffering from tuberculosis in its varying stages, I have used tuberculin in over 2,000 hospital cases. I attribute the generally unfavourable results to the fact that the tuberculin was obtained from virulent cultures of human bacilli. The reactions produced in some cases were disturbing, and probably due to overdosage. This is entirely obviated by using attenuated bovine cultures, which never produce reactions

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not only to be able to see with the ophthalmoscope, but to be able also to interpret what is seen. Even a skilled observer may not always find it easy to differentiate between the normal and the abnormal. The transition from the physiological to the pathological is in many cases so gradual that it may be very difficult to detect the initial departure from health. It is, however, the aim of scientific medicine to investigate the trivial and the early symptoms of disease, and it must be acknowledged that in practice it is a more difficult problem than to explain the end results of gross manifestations of disease.

Pulsation in vessels as small as those of the retina is so feeble in physiological conditions that it is not noticeable with the ordinary ophthalmoscope, although it can usually be seen with an instrument of high magnifying power. The intraocular circulation is peculiar in so far that it has to be carried on under a pressure of 25 mm. of mercury, and the reason why pulsation is not observable in ordinary circumstances is because the blood-pressure and the pressure of the intraocular fluids are so nicely balanced. If, however, any breakdown occurs in the physiological arrangement, either by a sudden fall in general blood-pressure as in aortic regurgitation, or by an increase of intraocular pressure as in glaucoma, pulsation of the main branches of the retinal artery can always be seen.

Little medical significance is to be attached either to variations in the general distribution or to varying degrees of tortuosity of the retinal blood-vessels. In both respects great differences may exist compatible with perfect health and full vision. When, however, any apparent abnormality is more pronounced on one side than on the other it is very probably pathological, and should be regarded with suspicion.

Considerable variations in the size of the vessels may also occur, quite apart from disease. The vessels

Some Ocular Manifestations of Cardiovascular Disease, excluding Renal Complications.

By A. MAITLAND RAMSAY, M.D., LL.D., F.R.F.P.S.

Honorary Director, James Mackenzie Institute for Clinical Research, St. Andrews; Consultant Ophthalmic Surgeon, Glasgow Royal Infirmary.

THE circulation can be studied during life in the retina with the ophthalmoscope much more thoroughly than is possible in any other part of the body. The eye, owing to the transparency of its media and the magnification obtained by direct ophthalmoscopy, offers a unique and easily accessible field for observation, and as the structures are examined under natural conditions more reliable results are likely to be got from the systematic use of the ophthalmoscope than from any other method of research. The earliest signs of vascular disorder are in many instances to be seen in the fundus oculi, and the pathological changes visible in the eye may be regarded as an index of what is taking place hidden from view in other parts of the body. It is unfortunate that so many are content to leave the use of the ophthalmoscope to the ophthalmologist, because a specialist has few opportunities to appreciate the real value of the instrument in general practice. An electric ophthalmoscope, equally with a stethoscope and a clinical thermometer, ought to be a part of the ordinary outfit of every family doctor. A certain amount of training and experience is doubtless required, for it is necessary

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themselves are not visible with the ophthalmoscope. It is the column of circulating blood that is seen, and arteries are distinguished from veins by the colour of the blood. The vessel walls are so transparent and their index of refraction is so nearly that of the retina in which they lie that in the healthy state they cannot be distinguished, and if blood be prevented from entering an artery its wall will show no trace of its existence.

It is well known that the retina is transparent to ordinary light, and is in consequence almost invisible by the ordinary method of ophthalmoscopic examination, but Friedenwald¹ has demonstrated that if light of the proper wave-length—yellow-green—is used, a maximum definition and contrast are obtained, with the result that the smallest blood-vessels and even the capillaries of the retina can be seen. It is obvious that any method of examination by means of which the capillaries can be studied during life is a great advance over older methods. The capillaries are the most active, purposive and dynamic part of the vascular system, and all vital processes take place through their walls.² The capillary network of the retina is one of the most delicate in the body, and it can function properly only when blood of normal quality circulates through it. The quality of the blood is of more importance than the quantity. Whenever toxins circulate in the blood grave disorder of visual function at once results. It is well known, for example, that a patient poisoned by santonin or by digitalis complains that everything he looks at appears yellow. Over-use of tobacco or alcohol gives rise to toxic amblyopia. Bacterial toxins may act in a similar manner, because the retina is such a highly differentiated structure that various toxins acting upon it will cause pathological alterations of a closely related type. Abnormal dilatation of the capillaries is always the first step in the pathological process, and is closely followed by loss

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of translucency, which is one of the chief characteristics of the toxic fundus. Translucency of the walls of the retinal vessels is, indeed, one of their most delicate properties, but one which they lose at once from auto-infection or autointoxication.

Whenever morbid changes, characterized by loss of transparency, become established in the capillaries it is only a matter of time before the arterioles and later the larger arteries suffer. Long before the walls of the vessels show any signs of gross disease, however, serious disturbance of function may be manifest. For example, the prolonged use of ergot causes such extreme temporary contraction of the retinal arteries that blindness follows, but the amaurosis is transient and passes off whenever the ergot is discontinued. The symptoms caused by ergot are therefore analogous to those that occur in migraine, and in a more persistent form in Raynaud's disease. The phenomena are believed to be due to spasmodic contraction of the walls of the arteries, and it occasionally happens that spasm of a branch of the retinal artery can be seen with the ophthalmoscope.

These changes in the intraocular circulation never occur in a state of health. In all likelihood morbid alterations in the capillaries precede and lead up to the occurrence of the spasm, and the fact that the course of the occluded artery can usually be traced is proof that it has lost its normal transparency. Amblyopia fugax is, therefore, in many ways analogous to intermittent claudication. In both of these conditions an underlying constitutional state exists—probably a form of autointoxication. If that be the case, a rational treatment must aim at eliminating the toxic cause.

Persistent autotoxæmia is always accompanied by a state of increased blood-pressure. Hyperpiesia must be regarded, therefore, as a symptom rather than a

disease. In physiological conditions the arterial blood-pressure in the retina is regulated by the systemic blood-pressure, and according to Benedict a good approximation of the pressure in the central artery of the retina can be got by multiplying the systolic blood-pressure by 0.54 and the diastolic by 0.45. As far as the health of the eye is concerned, however, it is the pressure in the capillaries that is all important, but in the nature of things capillary pressure can never be regarded as a constant quantity. It is probably higher in the eye proportionately than in any other organ of the body in a state of rest, and it certainly varies from time to time, in order that it may be able to respond with extreme delicacy and rapidity to the ever-varying requirements of the organ of vision.

As long as the walls of the retinal blood-vessels are healthy they seem to be capable of resisting an extraordinary high systolic blood-pressure.³ It is true that intraocular hæmorrhage occasionally occurs at birth, but in these circumstances it is likely to be due to direct traumatism, and is of the nature of a concussion injury. In whooping-cough subconjunctival ecchymosis and ptechia in the skin are common, but hæmorrhages in the retina are very rare. Traumatic asphyxia is another example, the symptomatology of which is well illustrated by the following case reported by Sir George Beatson:⁴

The patient was a miner, aged 24, who, while working with hitches at the bottom of the pit shaft, was caught by the descending pit cage and almost doubled up. His body was compressed antero-posteriorly, the shoulders being crushed forwards and downwards on the abdomen and pelvis. He was kept in this position under the cage for about three minutes before he could be released, and he said that during that time he felt "as if all the blood in his body was coming out at his head." On admission to hospital two hours after the accident his face and neck were livid and swollen. The eyes bulged forwards, the lids were greatly congested, and the sclerotics were completely hidden by a dense subconjunctival hæmorrhage. The lips and tongue were cedematous, and a large hæmatoma had formed under the tongue. In spite of such pro-

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found and extensive vascular changes no retinal hæmorrhages were found. The absence of intraocular bleeding was the more remarkable in this case, because sight began to fail from progressive atrophy of both optic nerves some months after the patient was considered to have made a good recovery.

Persistent high blood-pressure must be of rare occurrence in the healthy, although transient attacks frequently occur in consequence of emotional excitement, dietary indiscretions and such-like causes. Hyperpiesis is always followed sooner or later by sclerosis of the walls of the arteries. Marcus Gunn⁵ has pointed out that old age does not of itself cause arteriosclerosis, but that it is always secondary to some cause capable of inducing and maintaining high blood-pressure. Arteriosclerosis may, therefore, be regarded as a sequela of high blood-pressure. The disease rarely confines itself to one system of vessels, but is usually much more advanced in one system than in others. The small arteries of the retina are especially liable to attack, consequently the morbid process can be studied in the fundus oculi with a minuteness which is not possible in any other part of the body. The earliest signs of the onset of the disease are a general loss of translucency of the background of the eye and a brick-red congestion of the optic disc.⁶ Other even more characteristic signs develop subsequently, one of the chief being pronounced corkscrew tortuosity of the small vessels in the region of the macula. There is also abnormal visibility of the walls of the larger vessels, which appear to be accompanied by white lines. A further stage in the pathological process is reached when a vein is crushed by an overlying artery. The circulation is hindered thereby and the distal end of the vein becomes dilated. Occasionally minute aneurisms form, but not so frequently as in the small cerebral arteries. As an end-result the artery becomes converted into a fibrous cord, which is described ophthalmoscopically as a "silver" or "copper"

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wire artery.

Arteriosclerosis of an arteriole causes starvation of the capillaries which it feeds, and in consequence the retina suffers from want of nourishment. In these circumstances the walls of the capillaries soon become damaged, and much of the subsequent trouble can be traced to this cause. In the case of the retina, impaired nutrition causes defective vision, which is indicated in the first instance by disturbance of the light sense, accompanied by disordered perception of colour. These symptoms may be the first manifestations of disease so far as the patient is concerned. The physiologist has demonstrated the mechanism of their production, and what happens structurally in the retina occurs in all probability in similar circumstances in every other organ of the body. Damage to the capillaries is the fundamental cause of the earliest symptoms of disease. The progress of the morbid process can be observed in the eye during life, and in other organs—heart, lungs or kidneys—it may in favourable cases be demonstrated with the microscope after death. The specialized cells of an organ together with their capillaries form its physiological unit, and in every instance the degree of disablement is in direct proportion to the amount of damage to the functioning units. Capillary diapedesis, hæmorrhage and œdema are the first milestones on the road ending in destruction of tissue. In the retina the whole pathological process culminates in atrophy of the optic nerve.

The end-result is reached through a stage of arteriosclerotic retinitis, which may be defined as a local vascular disease evolved from high blood-pressure and arteriosclerosis.⁷ It is usually associated with similar vascular changes in the kidney, but it also exists as an independent pathological entity in no way influenced by renal inadequacy. The prognosis of arteriosclerotic retinitis is always serious, because even in the absence

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of renal complications, the patients usually die from cerebral hæmorrhage or from cardiac defeat.

The chief points, therefore, to consider in forming a prognosis in an individual case are high blood-pressure, the ophthalmoscopic appearance of the retinal vessels, and the state of the urine.⁸ The last must never be omitted, and the examination should be something more than a test for albumen and sugar. The sediment must always be examined with the microscope, and a complete investigation ought also to be made of the full functional efficiency of the kidney—not merely of its power to concentrate urea.

It has already been said that high blood-pressure is not likely to cause hæmorrhage provided the vessels are healthy. If, however, hyperpiesia is associated with vascular degeneration, extravasation of blood is liable to occur. In these circumstances the walls of the vessels cannot resist the strain, but the ætiology goes even deeper, because the essence of retinal hæmorrhage is disease of the capillaries and interference with capillary circulation. Two main factors, therefore, determine the occurrence of hæmorrhage: (1) increase in blood-pressure; and (2) decrease in the strength of the walls of the vessels; and in addition the quality of the blood itself must always be considered. An attack is determined by over-exertion, straining at stool, nervous excitement, abuse of food or alcohol, or by any cause that for the moment increases the toxic quality of the blood.

Although the occurrence of intraocular hæmorrhage makes little difference to the prognosis with regard to life, yet it greatly increases the danger to sight. Obviously the amount of damage depends upon the size and the site of the hæmorrhage. Small scattered flame-like extravasations in the nerve fibre layer of the retina are, as a rule, never alarming, and unless they are very numerous the patient may be unaware of their existence

without warning blindness occurs in one eye. The patient cannot distinguish day from night, but external examination of the eye shows no abnormality. The immediate effect of the block in the artery is to produce intense anæmia of the retina, which rapidly loses its transparency as a result of coagulation necrosis of its ganglion cells. The characteristic feature of the ophthalmoscopic picture is the cherry-red spot in the macula. This is not a hæmorrhage, but whereas over the fundus generally the loss of transparency of the retina prevents any bright red reflex from being seen, the retina at the macula is devoid of ganglion cells and is so exceedingly thin that the red choroid shines through it. When one of the branches of the retinal artery is blocked the embolism can be seen with the ophthalmoscope, and in these circumstances the testing of the field of vision will demonstrate that the loss of sight is limited to the area of the retina supplied by the occluded vessel. There is a resemblance between the branches of the central artery of the retina and those of the brain in so far that they are "end arteries," and do not anastomose; consequently, after the main trunk or one of the principal branches of the retinal artery becomes blocked its function can never be restored. The retina becomes atrophic in course of time, and its arteries reduced to mere threads; the end-result is secondary atrophy of the optic nerve.

In infective endocarditis the anastomosis of the capillaries of the choroid and those of the optic disc is a favourite site for the lodgment of bacterial embolisms. These form the starting point for the development of a form of metastatic ophthalmia, which occurs very occasionally in the course of such infectious diseases as puerperal fever, pneumonia, influenza, measles or scarlet fever. When, however, ocular complications do occur in the course of these diseases they are generally preceded by the development of endocarditis.

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The onset of the eye symptoms is sudden. The patient may make no complaint, but the conjunctiva of one eye is noticed to be injected and swollen. These signs should never be mistaken for conjunctivitis, because vision is always seriously impaired, and the details of the fundus cannot be seen with the ophthalmoscope. The vitreous gradually becomes infiltrated with leucocytes, a yellow reflex appears in the pupil, and if the patient be a child the symptoms may suggest glioma of the retina. In some instances the eyeball is destroyed completely by suppuration, but in the majority the inflammation subsides before panophthalmitis develops. In a few cases there is recovery of useful vision, but as a rule blindness accompanied by softening and shrinking of the globe is the end-result.

In chronic pyæmia, micro-organisms circulating in the blood may readily lodge in the uveal tract and cause ophthalmitis. There is usually a history of some local infection, which may at the time of its occurrence have been considered of little importance, but the really serious nature of which has later on been manifested by the development of glandular enlargements. The onset of the ocular symptoms is frequently preceded by a severe rigor, followed by high temperature, and although there may be little complaint of pain the patient always feels very ill and exhausted. A characteristic anæmia develops early in the course of the disease and is steadily progressive. The prognosis is grave.

Venous thrombosis is always a danger signal and may implicate the central vein of the retina or may confine itself to one of its branches. As a rule the patients are elderly, suffer from high blood pressure and from other signs of cardiovascular disease: but the young may also be attacked as a result of a local phlebitis complicating an acute febrile disease like influenza. In thrombosis of the central vein Coats has

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Of all the ocular manifestations of cardiovascular disease none is so dramatic in its onset or so tragic in its results as cavernous sinus thrombosis.¹⁰ The venous communications of the cavernous sinus are so numerous and so widespread that infection may reach it from so many different directions that the possibility of its supervening must never be forgotten. Following the occurrence of a focus of infection, situated on the skin of the face, in the nostrils, the mouth or the middle ear, the patient complains of severe headache, accompanied by shivering and vomiting, and shortly thereafter the eyelids on one side become swollen and discoloured, and the eyeball is observed to be unduly prominent. There may or may not have been a complaint of dimness of vision in the affected eye, as the patient feels so ill and restless from the pain that he may not have noticed the impairment of sight until the other eye is attacked. This generally occurs within a day or two after the beginning of the disease; the onset is sudden and the proptosis, as well as the lividity and swelling of the lids of the second eye, is usually more pronounced than it is in the one first affected. It is important in connection with diagnosis to

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demonstrated that the block occurs behind the lamina cribrosa. When the obstruction takes place in one of the branches of the main trunk it is usually the superior temporal that is implicated, and the immediate cause is crushing of the vein by an overlying artery whose walls have become hardened from arteriosclerosis. Failure of sight, usually noticed on first waking in the morning, is the most arresting symptom. There may have been premonitory attacks of transient blindness, and complaint of the persistent presence of phosphenes, but in the majority of cases the onset is sudden and unexpected, and if the main trunk be obstructed the loss of sight is complete. The sequence of the happenings can be seen with the ophthalmoscope when the thrombosis occurs in one of the branches of the vein. Following immediately on the block in the circulation all the retinal veins become congested and tortuous, and the fundus is bespattered with hæmorrhages, some of which are of large size and very slow in absorption. An attempt to re-establish the circulation takes place very quickly "either by the development of collateral channels, which are always tortuous and slow in forming but may apparently become thoroughly efficient, or by way of canalization of the thrombosed vessel, or by a combination of these two processes." ⁹ The vein that was obstructed gradually becomes converted into a fibrous cord, but in favourable cases there is a wonderful restoration of the circulation by means of newly formed blood-vessels in close communication with the capillaries. One of the most serious sequelæ of venous thrombosis is secondary glaucoma, for which the eye has in many instances to be enucleated.

The ophthalmoscopic study of vascular degenerations demonstrates that danger to life is greater when the vessel implicated is on the arterial side of the capillaries than when it is on the venous side, whereas the reverse is the case in the prognosis regarding danger to

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sight. Profuse hæmorrhage following rupture of an arteriosclerotic artery in the retina is exceptional, but when it does occur in the eye it affords a ready explanation of the danger to life when a similar occurrence takes place in the brain. On the other hand the repeated and ever-deepening recurrences in venous thrombosis of the retinal vein prove that thrombosis and hæmorrhage are not separate factors, but that both are due to a combination of high blood-pressure and vascular degeneration. The ophthalmoscopic appearances observed over a period of months in retinal thrombosis are a wonderful picture of what probably happens during the long-drawn-out and steadily downward course of cerebral thrombosis.

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remember that in cavernous sinus thrombosis the signs at the commencement of the disease are confined wholly to one side, and that they become bilateral later on. Cellulitis confined to the orbital cavity rarely occurs on both sides simultaneously, but in thrombosis the implication of both orbits is frequent. Indeed, as Sir William MacEwen¹¹ points out, the side on which the symptoms began "may be partially restored while the other side becomes markedly affected." He regards "this alternation of the seat of symptoms" as an important distinction "between inflammations confined to the orbital cavity and cavernous thrombosis." Ptosis is usually present and is due either to implication of the nerve supplying the levator muscle, or simply to the swollen and often brawny condition of the upper eyelids themselves. The conjunctiva is chemosed, protrudes, and usually discharges a thin, irritating mucopurulent secretion. The skin of the brow and the root of the nose is swollen and erythematous. The corneæ are usually anæsthetic, and when the proptosis is great they are not properly protected by the lids and, consequently, quickly suffer from exposure. The pupils are dilated and fixed, and when the state of the cornea permits ophthalmoscopic examination, acute neuro-retinitis is frequently observed. The movements of the eyeballs are impaired, and sometimes a well-marked squint is present. Palpation increases the pain, but fluctuation is rarely detected. The temperature is always high, the pulse quick, small and thready, the respirations increased, and the urine usually contains albumen. Even to an unskilled observer the patient appears to be dangerously ill, and the suffering is obviously very acute, but it is characteristic that the mental faculties remain unimpaired. Indeed, one of the most pathetic features of this disease is the fact that the patient retains consciousness almost to the end.

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The course of the illness is steadily downward, for while the eye first affected so far improves that there may even be partial recovery of sight, the other eye becomes worse and worse, and the constitutional symptoms more and more critical. The proptosis increases, the chemosed conjunctiva becomes necrotic, the cornea suppurates, and œdema spreads from the eyelids to the brow, temple, cheek, mastoid process and the upper part of the neck on the same side. The temperature is distinctly pyæmic, the pulse is rapid and becomes steadily weaker and smaller, the respirations increase in frequency, the tongue is dry and thickly coated, and secretion accumulates on the teeth and in the throat, so that it is difficult to keep the mouth clean and the breath free from a heavy foetid odour. Anorexia is complete, and often towards the end uncontrollable diarrhoea adds greatly to the patient's discomforts and rapidly increases his weakness. The disease rarely lasts longer than a fortnight, and a fatal termination is ushered in by rigors, hyperpyrexia, muttering delirium and loss of control over bladder and rectum.

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Cazenave recommended sudorifics, internally, particularly guaiacum; and, locally, tar ointment, or the iodide of mercury combined with olive oil, in the proportion of half a drachm to the ounce; to be pencilled on the eruption daily, or every other day. At the St. Louis Hospital at this time the ordinary remedies for lupus were not very successful and cod-liver oil was pushed up to six-ounce doses thrice daily, and M. Lemery pursued this method until he arrived at two pints in the day.

Our students should be warned against expecting an account of the modern treatment of lupus in textbooks of general surgery. "The Science and Practice of Surgery," by Romanis and Mitchiner, published in 1927, says (p. 139) that the treatment of lupus consists of excision and skin grafting where practicable, or failing this, curettage, which may be followed by exposure to X-rays, ultra-violet rays or radium. This account, although partially true, can only be described as so misleading as to form a *pièce justificative* for the removal of lupus from the surgical curriculum.

The transition from methods of barbarism such as cauterizing with fuming nitric acid to the modern therapy, can be traced in a series of papers from 1904, 1908, 1913, 1916, 1923, 1925 and 1927, from the Light Department of the London Hospital. Yet this work of recording and publication cannot cease. Its need was immediately brought to my mind by a distinctly pessimistic paper read by my learned and distinguished colleague, Dr. Dore, at the Annual Meeting of the British Medical Association at Edinburgh in 1927. In addition, the Metropolitan Asylums Board in their annual report for 1925-26, p. 299, published a conclusion that: "Patients with superficial tuberculous ulcers do well with light baths, but these cases are easily treated without the use of light. The local application of rays is of value in the treatment of lupus

The Treatment of Lupus Vulgaris.

By W. J. O'DONOVAN, M.D.

*Physician to the Skin Department, London Hospital; Light
Consultant, Whipps Cross Hospital.*

THIS quarter of a century has witnessed a great strengthening of the fight against tuberculosis; not that our power has been notably heightened by the discovery of the tubercle bacillus or by the elevation of tuberculin therapy, but because there has been during this period an increase in the assistance rendered by public health authorities, so that organized assistance is given us in the search for early cases, in our efforts to secure regularity of attendance during treatment.

An outstanding point is the positive stress now thrown upon constitutional treatment as opposed to the stress formerly laid upon local treatment. In 1863, Erasmus Wilson stated that the first indication in the treatment of lupus was to remove the local disease and the second by alterative tonic remedies to improve the general state of the health, and, if possible, act specifically upon the skin. Today, we know that lupus can be cured by stimulating the body metabolism by general light therapy only, but the time factor can be notably lessened by the wise combination of local and general treatment. As a constitutional remedy after regulating the system by general means, he gave the preference to the liquor hydriodatis hydrargyri et arsenici, in doses of ten or fifteen drops with meals three times a day, and accompanied it with cod-liver oil, in doses varying from one drachm to an ounce, taken directly after meals, twice or three times a day.

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Our students should be warned against depending on account of the modern treatment of lupus in the hands of general surgery. "The Science and Practice of Surgery," by Romanis and Richardson, published in 1927, says (p. 139) that the treatment of lupus consists of excision and skin grafting when practicable, or failing this, curettage, which may be followed by exposure to X-rays, ultra-violet rays or radium. This account, although partially true, can only be regarded as so misleading as to form a gross justification for the removal of lupus from the surgical domain.

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but the general light bath has little effect."

Medicinal Methods.—The use of mercury and arsenic, and latterly of thyroid extract by the mouth, has not stood the test of daily and continuous use, but there is one rare and special type of lupus in which the intravenous use of salvarsan preparations is of the greatest help, that is, the type of lupus affecting the muzzle area of the face, in which the destructive ulceration is rapid, in which the peripheral granulomatous nodules are large and in which thick scabbing of the ulcers is a noteworthy feature. In these cases, although the Wassermann reaction is negative, general light therapy or local treatment of any kind is alone of little avail, but improvement is rapid and maintained after a course of antisyphilitic treatment. I have not the courage of my French colleagues to suggest that these patients are suffering from a mitigated syphilis, or that it is lupus engrafted on a congenital syphilitic stock in which the Wassermann reaction has passed out. I believe an "hereditary syphilitic taint" would be the more historic expression. Dhuring said that potassium iodide is useful in some cases, and I have experienced, among many trials, two cases of widely disseminated lupus in which small doses of potassium iodide caused an immediate amelioration and ultimate cure of this condition.

Natural Cure.—The natural cure of lupus is rare. Cases of long standing frequently show large areas of central scarring with active peripheral infiltration, but occasionally one sees young children presenting keloidal scars on their faces, rarely calcified, which are the end-result of a local tuberculosis cutis in which no active therapy has been employed.

Lupus of the aged is not always hopeless. It is true that it would be unwise to attack an extensive thick infiltration of half a face in a person of 70, but when I have seen a lupoid infiltration of the nose of a woman

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aged 63, resembling rhinophyma in its size and repulsiveness, completely replaced by a shapely, unscarred nose after six months' light therapy, one must agree with the fact that some cases of lupus of the aged are amenable to treatment.

Disseminated Lupus.—An interesting type of lupus is that in which the skin of the body seems to be sown with numerous tubercle bacilli that have found entry into the blood stream during a specific fever, particularly measles. In these, five to fifty lesions may be present from the size of a millet seed to a sixpence, some of which are completely healed with sunken scars without interference, but other lesions show pathological progression. In such cases active local treatment should be devoted only to the larger areas of lupus, and if general light baths are given in addition to local treatment the whole of the disease will disappear. Nor, in my experience, are these cases of multiple lesions particularly liable to relapse in succeeding sunless winters.

Caustic Treatment.—In lupus of the forearms, knuckles or face, the use of caustics is certainly inadvisable, unless the tubercular process has advanced to a destructive degree. This last is particularly to be noticed in cases of lupus of the end of the nose where an ulcerated, bulbous and reddened extremity is due to permeation of the *alæ nasi* by the tubercular granomatous tissue. In these cases healing is always accompanied by a loss of tissue of one or both *ala nasi*, often with perforation of the nasal septum. Here, then, the patient is doomed to disfigurement, and it is my practice now, in these cases of deeply ulcerated lupus, to admit the patient to hospital and under an anæsthetic to paint out the lesions vigorously with a probe loaded with acid nitrite of mercury (B.P.). This was brought to my attention by my colleague Dr. Adamson, and after some little practice to achieve

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catalogues of instrument-makers or from textbooks hurriedly issued to cope with the recent boom in light treatment. The proper application of Finsen light requires a specially trained nurse, and I myself felt unfitted to supervise the experienced sisters in my department until I had been working with them daily for over three years. The recognition of a deep lupus nodule, covered by unbroken and almost unaltered skin, is essential for the adequate treatment of an area of lupus. The dosage of Finsen light treatment is not an hour weekly or an hour daily, but as much as can be given without distress to any particular area. In some patients four hours' treatment may be given at intervals during one day to a solitary lupus nodule. The aim is not to produce a blister—spoken of with much facility as a "good blister reaction"—but to produce a deep inflammatory reaction through the whole thickness of the dermis; the deeper the reaction the less likelihood of another treatment to that area being needed. In this way the affected area is treated portion by portion in turn, and when it is thought that the whole area has been adequately covered, the patient is given six weeks' rest from any local treatment. When all reaction has thus subsided the ground covered may be searched for any residual tubercular nodules. This treatment is aided and shortened by the use of daily arc light therapy. Arc light I esteem of greater utility in cases with a long clinical time factor and of pathological gravity.

Ill-effects from light treatment are extremely rare. Some few patients subjected to it for long periods of time develop tremors and introspective symptoms of great variety, but similar symptoms have developed, in my experience, in patients undergoing local Finsen light, when the area being treated was never greater than a quarter of an inch square at one time. When one knows the restlessness of the normal population and

the correct technique I have found it of the greatest value. It has to be remembered that the infiltration of lupus may be subcutaneous and cannot be reached by any ordinary superficial form of light therapy, whereas under this attack the whole area undergoes an immediate necrotic solution and the reaction is so severe as to produce rapidly a sunken healthy scar in which recurrences are extremely rare. Before these patients recover from the anæsthetic they are given a subcutaneous injection of morphia, the wound is dressed with an ointment of boracic and eucalyptus and when healed, they are, if necessary, supplied with shapely artificial noses moulded to photographs of their normal state. It is a moot point as to whether plastic surgery has any greater benefit to offer them. Particular care must be taken to see that the probe is not overloaded with acid, as if it trickles down it will leave a shallow, unpigmented scar on the skin.

Plaster.—Where the lupus is large and extensive, and where the patient's attendance is difficult, although his co-operation is keen, very gratifying results can be achieved by using a creosote and salicylic plaster, which is heated and applied to the skin repeatedly at intervals of 48 hours. This produces an erythematous and pustular reaction, in which the lupus nodules are replaced by small pits; a persevering use of this treatment will cure a lesion of several square inches of lupoid infiltration. Many patients, however, on account of its painful nature, will apply this treatment only on the day before they come to visit the clinic, and other means must then be used to treat these cases.

Dry Lupus.—The technique for the treatment of dry lupus is essentially the mastery of light therapy, which, I say advisedly, is best learned in a department experienced in this work. It is regrettable that light treatment has been started under the care of medical officers whose instructions have been received from the

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tissues below the skin are invaded, rapid malignant destruction cannot be overtaken.

Public Assistance.—The great results achieved by lupus clinics in the past should be overtaken and considerably surpassed by the present generation. Not only have we a new general therapy to assist the old, but we have a highly organized and keen public health service which is always willing to render the clinic every help in securing that regularity of attendance which is a *sine qua non*. The absolute necessity for this attendance is sometimes lost sight of even now; cases drift away for many reasons for three or more years at a time and the destructive havoc that can be reached by inattention is at once seen by comparison with the original photographic records. I make it a practice, nowadays, to undertake the treatment of no case of lupus among the poor unless the local tuberculosis officer has given his official approval. This checks, to a very great extent, the migration from hospital to hospital that the poor love and the sudden cessation of attendance of children when they have reached a wage-earning age. Also, one has a lever at hand to prevent treatment being interrupted by sudden desires of various societies to give these patients sanatorium benefit or convalescent treatment, or to break away for periods of fruit picking and so on.

Fatal Issues.—It is to me most extraordinary that so few cases of lupus die untimely. Very rarely, tuberculous meningitis develops when the lupus appears to have healed. More rarely still, tuberculous nephritis or amyloid disease terminates the fight. Phthisis is more than rare, unless it precedes the skin lesions.

Our lupus patients have a wonderful spirit. Most of them prefer work to idleness, and nearly all of them achieve marriage however mutilated they may be. They are faithful patients, keen co-operators and watchful critics of all that is done for them.

the great rate at which there is a labour turnover in our factories, one must not be surprised at the exhibition of neurotic restlessness in a large public light clinic. It would be wrong to attribute this phenomenon to light fatigue and compare it to the exhaustion produced by years of exposure to tropical sun.

Excision.—My colleagues in Copenhagen have a greater use for this method of treatment than we have in London, but it is important to consider that the great majority of cases of lupus occur on the face. In small cases such as are suitable for excision, the results of Finsen light therapy are altogether excellent and preferable to a surgical scar, which, in tuberculous cases, often becomes keloidal. There is a distinct field for this quick removal of the disease, however, in lupus lesions upon the trunk and limbs. We adopt it from time to time with successful results, but I would advise that in lupus cases the stitches be left in longer than is usual in surgical practice. The circulation of these cases is deficient, and I have in my mind a succession of three such cases, when on the removal of the stitches from the legs on the eighth day all three wounds fell open.

Complications.—Besides such deformities as microstoma, ectropion and nasal stenosis, that call for surgical relief, every case of lupus of the face must be watched continuously for the development of tubercles in the palate or nasal catarrh. We need the continual skilled help of surgical colleagues for the removal of tuberculous lacrimal sacs, the treatment of intranasal tubercles and occasionally for the sewing together of the eyelids to prevent the development of corneal ulcers.

In cases that have been treated by X-rays, the development of malignant papillomata may occur at any time and at any age from 18 to the later decades. If these are treated by diathermy as soon as they are recognized, the prognosis is good. Later, when the

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THE PRACTITIONER

resection altered to a considerable extent the possibilities of nasal surgery. It gave vastly better results, and afforded an opportunity which the earlier operations did not give of improving the airway and drainage of the nose by modifying the nasal framework instead of at the expense of the turbinate bodies—which are the functioning parts of the organ; and any operation which conserves function must be considered as a valuable asset to the credit of the operator and the comfort of the patient. It is on this score that it may be asserted that the submucous resection has played an important part in the prevention of catarrhal deafness. I possess notes of a number of cases in which this operation has been the means of removing permanently the menace which threatened patients with deafness from chronic middle-ear catarrh. In others, recurrent attacks of laryngitis have ceased permanently after this operation. When it is realized how either obstruction to the nasal airway or interference with efficient nasal drainage, or a combination of the two, may initiate and maintain a chronic catarrh of the upper air passages, the value of a surgical method which corrects these defects without interfering with functioning parts is obvious.

When the merits of an operation begin to be questioned it may be that one of two things has happened. It is possible that familiarity has bred contempt and pre-existing conditions have been forgotten, as is the case with vaccination; or there may have been an undue number of failures due to faulty technique, and the submucous resection is not an operation that "anybody can do." It may therefore be expedient to indicate the essentials necessary to a good operation and the means whereby they can be attained.

An efficient submucous resection should result in a clean, straight septum, without perforation or adhesions. Obviously, no rhinologist not possessing

The Essentials of Septum Operations.

By MACLEOD YEARSLEY, F.R.C.S.

Consulting Aural Surgeon to the St. James's Hospital, etc.

INNOVATIONS are often adopted with acclamation, and, after holding an established position, give place to other and later methods. This is as it should be, being in the nature of progress. But there are occasions when the pendulum of popularity may swing back too far, and the once applauded measure receives an undue share of disapprobation. Certain remarks I have recently heard suggest that the submucous resection of the nasal septum is being unfairly condemned; that it does not always give the good results claimed for it; does not lessen the former tendency to colds; and so on. It may be that it has fallen into the hands of inexperienced operators, or that the essentials for success have not been observed as they should, or that some other cause is at work. Be that as it may, there are grounds for taking up cudgels in its defence, and, since I was one of the first to practise the operation some twenty-five years ago, and have by now accumulated an experience of well over a thousand cases, I may claim a decided opinion upon the subject. I would therefore submit that those who speak in disparagement of the method are either unfortunate in their experience or suffer from a derangement of perspective.

When one considers the position of rhinology, and especially the unsatisfactory nature of septum operations at the time when Killian introduced his method, I think it is no exaggeration to say that the submucous

resection altered to a considerable extent the possibilities of nasal surgery. It gave vastly better results, and afforded an opportunity which the earlier operations did not give of improving the airway and drainage of the nose by modifying the nasal framework instead of at the expense of the turbinate bodies—which are the functioning parts of the organ; and any operation which conserves function must be considered as a valuable asset to the credit of the operator and the comfort of the patient. It is on this score that it may be asserted that the submucous resection has played an important part in the prevention of catarrhal deafness. I possess notes of a number of cases in which this operation has been the means of removing permanently the menace which threatened patients with deafness from chronic middle-ear catarrh. In others, recurrent attacks of laryngitis have ceased permanently after this operation. When it is realized how either obstruction to the nasal airway or interference with efficient nasal drainage, or a combination of the two, may initiate and maintain a chronic catarrh of the upper air passages, the value of a surgical method which corrects these defects without interfering with functioning parts is obvious.

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concealed wings can claim never to have performed a submucous resection in which perforation or adhesions have not occurred. The operation is one which calls for experience and technique of a high order, and not even the best of us can avoid occasional failure at some time or other. The best a surgeon can do is to operate with the factors which make for success before him, and never to take unnecessary risks. The factors which count are good illumination, a skilled anæsthetist, careful preparation of the nose, thorough operation, and an after-treatment with as little interference as possible. The first two of these are so self-evident that they need no further comment; unless the operator can see every part of his progress and he and his anæsthetist are accustomed to work together, trouble is likely to ensue. Personally, I prefer general anæsthesia as affording better scope in operating.

As regards preparation, it is obvious that, unless a bloodless operation can be assured, disaster is almost inevitable; one must see clearly every step. My own procedure, which has stood the test to my satisfaction for many years, consists in painting the septum with a mixture of equal parts of a 10 per cent. solution of cocaine and a 1-1,000 solution of epinine, making a percentage of five of the former drug. The synthetic epinine is to be preferred to adrenaline as being more stable. This painting is done at two-minute intervals for twenty minutes, and should be carried out by the surgeon himself or by a trustworthy assistant. It causes less discomfort and is more satisfactory than plugging. It may be added that efficient preparation means also a lighter general anæsthesia.

Under this combination of anæsthesia and local preparation, thoroughness of operation can be practically assured. I prefer to operate with the patient in the sitting or, more rarely in special cases, semi-recumbent, position. The greatest care of the muco-

SEPTUM OPERATIONS

perichondrio-periosteal flap is essential, together with thorough separation and isolation of the bony-cartilaginous septum. This done properly, the rest of the operation is simple and easy. The front part of the isolated septum is cut out with a Ballenger's swivel knife, and the remainder removed by appropriate forceps. The fewer instruments used the better. I once counted forty-seven implements of varying ingenuity laid out for the use of a young rhinologist, and I was not able to ascertain that they materially added to his success. I have reduced my number to ten, including two specula and the forceps used for swabs. Swabbing, by 6-in. strips of gauze, should be done very gently by an expert assistant; properly done, this is of great help. For the palatal crest I have long discarded chisel and gouge in favour of Huff's cutting forceps, a valuable and effective instrument which removes it cleanly and neatly. One of the most common causes of failure lies in not removing enough of the septum, and, as the operation is one which cannot be repeated, this is a serious matter. At the same time, care must be taken to leave a small anterior buttress for the support of the nasal bones. When the operation is completed to the satisfaction of the surgeon, it is useful to test it by adjusting the flap and passing the handle of the Ballenger's knife through either nostril to the nasopharynx; if it does not pass easily, and without forcing, an inspection should be made for the discovery and rectification of the cause. Finally, the flap should be readjusted and enlarged posterior ends of the inferior turbinates removed by a suitable guillotine; failure to effect this militates seriously against an efficient operation.

Plugging for four-and-twenty hours is another essential. The best material to use is compressed gauze cut into suitable splints and well coated with sterilized vaseline. These splints are perforated anteriorly

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The Diagnosis and Treatment of Chronic Intestinal Stasis in Children.

By A. GRAHAM-STEWART, M.B., CH.B.

Late Honorary Physician, Lawn House Home and Hospital for Children, Margate, etc.

IN children chronic intestinal stasis is extraordinarily and deceptively common. It is the result of wrong diet and wrong habits. The bulk of children who do not look well, children who are classed as "delicate," and those who fail to thrive and are always a source of anxiety to parent and doctor alike, are generally, in varying degrees, the victims of this state. The condition is easily diagnosed and the response to treatment is often little short of dramatic.

SIGNS AND SYMPTOMS.

The child generally looks pale and pasty, with baggy eyes (the bagginess around the eyes is almost pathognomonic) and the eye itself dull. It is pot-bellied in many cases and the abdominal muscles are flabby and toneless; the skin of the abdomen and flanks is stained a dirty brown colour (this staining is also practically pathognomonic). Developmental failure is general—spinal curvature and flat-foot. The joints, especially the elbow joints, are over-extensible (a third pathognomonic sign), and, for a fourth, the upper part of the back is covered with downy hair, sometimes very long. The skin may have an unpleasant odour, its elasticity is diminished, and the face of the child is sallow and often infiltrated. Venous peripheral stasis is common—e.g. the mottled leg; the feet are cold and the hands

for the passage of loops of flat "French braid," which, when the splints are in position, can be secured to the bridge of the nose by a strip of strapping. By the inhibition of moisture these splints swell laterally, compressing the new membranous septum and keeping the flap in position, making sutures unnecessary.

After-treatment consists chiefly in not worrying the patient. The splints are removed after twenty-four hours, having been previously loosened by a few drops of hydrogen peroxide, so that they slip out easily with one pull. Smart bleeding may ensue, but quickly ceases. Nothing further should be done for the second twenty-four hours, after which the daily instillation into the nostrils of hydrogen peroxide (five vols. strength) every four hours is continued for about seven days. This sufficiently clears the nostrils, and nasal washes or douches, or forcible blowing through the nose cannot too severely be deprecated as fertile causes of complications, especially of the ear. I have seen serious trouble arise—fortunately not in my own practice—by such meddlesome methods. The patient should be kept in the nursing-home for a full week, and warned to take extra care for a like period after leaving; to allow him to leave the home after a lesser period is to court disaster.

These appear to me to be the essentials of a good submucous resection, and will ensure a high percentage of successes. But even with the most successful operation, one may meet with cases in which the ultimate success is less satisfactory than was expected. All the more necessary is it, therefore, never to take risks, and it must be remembered that, if catarrh recurs after a well-performed operation, the patient is in the best possible situation for general treatment, and in the majority of cases it will be found that a chronic intestinal intoxication is the underlying cause.

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clammy; glandular enlargements are common, especially in the abdomen and groins; and the child is often the subject of recurring bronchial attacks. Many are little old people, prematurely altered.

These are the children liable to repeated attacks of acidosis. The appetite is poor and fickle, the tongue is heavy and the breath unpleasant; these children fail to gain weight, they are nervy and restless at night and are a source of continual anxiety. The chest is flat and expansion is defective. Irritability and easy fatigue are present, and black rings encircle the eyes. They suffer from gross constipation in that they pass a hard and slimy but perhaps regular motion once a day—hopelessly incomplete and generally evil smelling—and the little colon is never emptied. Long periods of slight fever at night are common—fever of known origin. They sweat easily and at night the little heads are always wet.

These are the children who, unchecked, are the future candidates for—among acute things—appendicitis; and, among the more chronic, tubercle in some form. In my experience tuberculosis in children is rarely primary; it is a state secondary to lowered resistance and this lowered resistance is the result of (1) chronic auto-toxæmia and (2) a diet deficient in “roughage” and in its balance of vitamins.

A bacteriological examination of the fæces generally confirms the diagnosis, and the matter can be clinched by an adequate bismuth transit and barium enema, when one or more of the following states will, if the above clinical signs be observed, invariably be found to be present: (a) An elongated pelvic colon—caused by “puddling,” the result of (c); (b) A “controlling” or unhealthy appendix; (c) A “first-and-last” kink (Lane’s kink: iliac colon); (d) As a result of (a), (b), or (c), stasis involving some or all parts of the large intestine; (e) Sacculation, thickening of the iliac colon

CHRONIC INTESTINAL STASIS

and of the terminal coil of the ileum and tonic spasm—this spasm is common at the ileo-cæcal valve and in the terminal coil—pointing to catarrh and irritation; (f) Torsion in various regions, acting in the same way as a kink; (g) Loose adhesions in various regions—bands are often present in quite young children; there is plenty of evidence that these bands are formed very early in life indeed.

ILLUSTRATIVE CASES.

Case 1.—L. F., male, age 4 years. Pale, fragile looking, and emaciated. Every few weeks he had a serious attack of acidosis accompanied by filthy motions. Tuberculous discharging sinus in the neck, persistent nocturnal temperature, chronic, though unsuspected, constipation; no appetite. He was an only boy and the despair of his people. He was actively treated medically for six months; result: practically nil; acidosis attacks continued. Bismuth transit and barium enema by Dr. A. C. Jordan. X-ray report: first-and-last kink and controlling appendix present; ileal stasis and severe stasis involving all parts of the large intestine. Operation by Sir W. Arbuthnot Lane: the tethered iliac colon was freed and the controlling appendix removed; the previous medical treatment was again instituted. Result: in the four years since the operation there has not been a suspicion of an attack of acidosis, weight was rapidly gained, the boy developed a fine healthy colour and an excellent appetite. From a little human wreck he is now a fine sturdy boy, full of vigour and life and muscle. Previously his life was one long misery of illness.

Case 2.—E. F., female, age 6 years. Another human wreck—in spite of having had the best of everything—pale and weak and emaciated, with gross spinal curvature and perpetual recurring attacks of bronchial catarrh. History of chronic ill-health; a year previously a condemned appendix was removed, with no improvement. All signs of severe auto-intoxication present; the bronchial state had received all the treatment—a mere secondary symptom. The child looked very ill and lived the life of a little old invalid. X-ray report by Dr. A. C. Jordan: great elongation of pelvic colon, much over-distension and habitual over-filling of cæcum and ascending colon with incompetence of the ileo-cæcal valve; hypertrophy of the terminal coil of the ileum with pyloric spasm (secondary to ileal stasis) leading to great delay in and enlargement of the stomach. Bacteriological report: marked growth of streptococci. Result: complete system of medical treatment was employed. In nine months she had gained 26 lb. in weight. It is five years now and there has been no suspicion of another bronchial attack since treatment was begun. She is now a strong, strapping girl, finely developed, and with a straight spine, and she

clammy; glandular enlargements are common, especially in the abdomen and groins; and the child is often the subject of recurring bronchial attacks. Many are little old people, prematurely altered.

These are the children liable to repeated attacks of acidosis. The appetite is poor and fickle, the tongue is heavy and the breath unpleasant; these children fail to gain weight, they are nervy and restless at night and are a source of continual anxiety. The chest is flat and expansion is defective. Irritability and easy fatigue are present, and black rings encircle the eyes. They suffer from gross constipation in that they pass a hard and slimy but perhaps regular motion once a day—hopelessly incomplete and generally evil smelling—and the little colon is never emptied. Long periods of slight fever at night are common—fever of known origin. They sweat easily and at night the little heads are always wet.

These are the children who, unchecked, are the future candidates for—among acute things—appendicitis; and, among the more chronic, tubercle in some form. In my experience tuberculosis in children is rarely primary; it is a state secondary to lowered resistance and this lowered resistance is the result of (1) chronic auto-toxæmia and (2) a diet deficient in “roughage” and in its balance of vitamins.

A bacteriological examination of the fæces generally confirms the diagnosis, and the matter can be clinched by an adequate bismuth transit and barium enema, when one or more of the following states will, if the above clinical signs be observed, invariably be found to be present: (a) An elongated pelvic colon—caused by “puddling,” the result of (c); (b) A “controlling” or unhealthy appendix; (c) A “first-and-last” kink (Lane’s kink: iliac colon); (d) As a result of (a), (b), or (c), stasis involving some or all parts of the large intestine; (e) Sacculation, thickening of the iliac colon

CHRONIC INTESTINAL STASIS

(f) Continual mild evening pyrexia otherwise unaccounted for.

TREATMENT.

Surgical.—If there is a controlling appendix or a first-and-last kink, the help of the surgeon is almost invariably necessary as these are the cases that do not and cannot respond satisfactorily to medical treatment. Any case of chronic intestinal stasis, correctly diagnosed as such, where a bismuth transit and barium enema have not been done, and where there is failure in response to a complete form of medical treatment covering a period of 3 to 6 months—such case may almost certainly be said to have a mechanical obstruction, such as a kink or a controlling appendix. The only resort then is X-ray confirmation and, if necessary, surgical intervention to release the mechanical obstruction. This is even more essential in children than in adults, and the results I have seen have been uniformly successful and excellent.

Medical.—(1) Rest.—In the debilitated and toxæmic child this is the first essential. The ideal method of resting a child is the use of a spinal carriage—3 months of this to start with, in the open air, and getting as much sunlight as possible. It is useless to try to treat these debilitated children when they are running about in the ordinary way—exhausting still further devitalized structures. The omission to rest accounts for failures. It is an invitation to tubercle to come along and cannot too strongly be insisted upon.

(2) Diet.—This must be rigidly enforced. The only two restrictions are that flesh and artificial sugars shall be banished from the dietary. The diet should be as follows: Milk and milk dishes, excluding milk puddings, cream, eggs and egg dishes, plain cheese and cheese dishes, and butter—in short, all fresh dairy produce. A genuine wholemeal bread, biscuits made

THE PRACTITIONER

has not had a day's illness since treatment began. Previously her life was nothing but illness upon illness.

Case 3.—G. A., male, age $2\frac{1}{2}$ years. Pasty face with great bagginess around the eyes, over-extensible joints, chronic constipation (strenuously denied by his mother), and general ill-health. Became fagged out on the slightest exertion. The chief worry of the mother was that this little boy looked very ill and had a severe vomiting attack about once a month. No X-ray. Result: was put on "modified" treatment (that is, vaccines, colonic lavage, and a belt were omitted). This was three years ago, and he has not had a vomiting attack since. He gained weight rapidly, has lost his baggy eyes and easy fatigue, and when last seen—a year ago—he had a healthy colour, a good appetite, and was full of life and go. His chronic ill-health had entirely disappeared, and the pasty face had given place to rosy cheeks.

Innumerable similar cases could be quoted; the above suffice to illustrate the type, both medical and surgical.

DIAGNOSIS.

(a) The clinical signs and symptoms above enumerated. General failure in health, otherwise unaccounted for, is probably the most suspicious and important sign.

(b) Bacteriological investigation of the fæces.

(c) Medical inspection of the motions. These are generally most incomplete (the chief fault), hard and finely, or grossly, smeared with mucus, are friable and offensive. On the other hand, motions may appear normal and yet stasis exist. One trap is in accepting a mother's opinion that her child is "never constipated": her view of constipation is far from compatible with physiological righteousness.

(d) Investigation by a bismuth transit and, more important still, by means of a barium enema.

(e) Abdominal examination. This generally reveals various points of tenderness on palpation, chiefly in the regions of the iliac colon and the cæcum. An irritated and inflamed kink has a most characteristic point of tenderness: it is the best evidence of all of the presence of a kink.

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CHRONIC INTESTINAL STASIS

in the pot-bellied child and where there is sagging in the colon.

(5) Vaccines:—In the markedly streptococcal cases a vaccine may be of great use. Small doses, without producing reactions, should be given weekly and, needless to say, painlessly.

(6) Position for defecation:—A chamber must be used for the child; the squatting position is vital to success in emptying the colon. A child dangling perilously over an adult's water-closet will never empty its colon, nor can its motions be properly inspected.

(7) The bed:—The foot of the bed should be raised on blocks 6 inches high; the reason for this is obvious.

(8) Colonic lavage:—This should be carried out in severe cases. It should be done three times a week for one month and twice weekly for a second month. Saline should be used to which has been added 1 to 2 drachms of kaylene to each pint; only half a pint, to a pint at the most, should be given, siphoned off again, and this giving and siphoning off of each half pint or pint repeated several times till all returns clear. On no account must enough fluid be allowed to enter the colon sufficient to produce distension.

(9) Drugs:—The bowels must be got to act twice daily at least, after food, if possible after each meal. Patience, practice and perseverance will bring this about. The motions should be soft and easy and complete, with no purging. For a time the bowels require help; later diet and exercise will keep them right. Three things are essential: (a) A good quality of paraffin, 1 to 4 drachms three times daily half an hour before food. (b) Tincture of belladonna, according to age, after breakfast and tea—enough to produce the mildest physiological effects. This drug is vital as it relaxes the deleterious spasm nearly always present. (c) 1 to 2 drachms of kaylene twice daily, between meals. This is an effective intestinal adsorbent, and rapidly

from the whole wheat, and biscuits made from rye, porridge made from coarse Scotch oatmeal, or Torbet lactic oats, eaten raw with cream, or rolled wheat, also eaten with cream or cooked for a short time. Fish and fish dishes; shell fish make a wholesome food. Fresh raw fruits of all kinds, especially oranges, lemons, grape fruit and tomatoes. Salads are important, and such things as watercress, mustard and cress, and endive—these can be made into sandwiches. Vegetables of all kinds, especially those that can be eaten raw, such as carrots, cucumber, celery, radishes and onions. Vegetables should be mixed, allowed to simmer and the liquor given with the vegetables. On no account must soda be used in the cooking of vegetables; steaming is the ideal way of cooking them. On account of the large cellulose content the following are of special value (figures denote percentage of cellulose): lentils (4), beans (4), onions (5), spinach, green peas, and carrots (8 each), apples (10), radishes (12), cauliflower (13), cucumber (14), asparagus (17), cabbage (18), strawberries (19), melon (22), pears (25), and raspberries (47). These do more than all other foods to scavenge and keep clean the cesspool region of the cæcum; “roughage” is the secret. For natural sugars give dates, currants, raisins, prunes, figs, etc. Nuts are excellent. From the point of view of getting a sufficiency of B and D vitamins, bemax should be given to supplement the former and ostelin the latter. A and C are adequately provided for in the dietary.

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(4) Mechanical support:—For the more severe cases a Curtis belt is of inestimable value—especially essential

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The Diagnosis and Treatment of Ectopic Gestations which End in Spurious Labour.

By CHARLES NOON, F.R.C.S.

*Consulting Surgeon to the City of Norwich Maternity Institution ;
Assistant Surgeon to Norfolk and Norwich Hospital, etc.*

CASES of extra-uterine gestation terminating in spurious labour and the death of the foetus are uncommon. The surgical treatment of the condition may be a matter of ease or difficulty. The danger of any operation may be much increased in some cases by reason of the fact that the foetus is alive, while in other circumstances the greater risk arises from the fact that the foetus is dead, and the case is complicated by the presence of septic infection.

In the case here recorded the operative procedure was quite simple. There was no hesitation in deciding that the placenta should be left for subsequent treatment or to separate by a natural process. The difficulty in the case arose chiefly in deciding when to operate and in the prolonged after-treatment of the case which was necessary for several months.

History.—I first saw the patient on November 29, 1927, and obtained the following history: She was a woman, 33 years of age; she had been married eight years and had one child now six years old. She had always been healthy, and menstruation had always been regular and normal up till the end of 1926; her last regular period lasted from January 21 till January 25; the periods then ceased. She remained well until March 12, when she had a sudden attack of abdominal pain, felt faint, and had to stay in bed for two or three days. At the same time she had some light vaginal bleeding which lasted from March 12 till March 18. Between May

THE PRACTITIONER

diminishes putrefaction. For children, kaylene-oil is better on account of palatability; it is an emulsion of paraffin and kaylene: dose 2 to 4 drachms before meals. If these fail to get the desired evacuations, older children can have a taxol pill once or twice daily and younger children a few drops of syrup of figs; these should be omitted as soon as possible.

SUMMARY.

If after from 3 to 6 months of this treatment (in long-standing cases 6 to 9 months), carried out completely and faithfully and without omissions, the child is not restored to health and has the appearance of health, or is not enormously improved in every way, and the parents and the medical man in charge are not completely satisfied—there is, I believe, one conclusion and one conclusion only: the diagnosis is incorrect or something vital has been omitted. Either the signs have been mistaken, an X-ray examination has been omitted, the evacuations have not been inspected and properly corrected, or a purely surgical case has been treated on medical lines only. With a correct diagnosis the effect of this treatment is certain and unfailing. This sounds dogmatic; and were it not that I have had scores of these cases through this treatment—watching them right through the whole course—without a single failure in the end, I feel I should fail in the message I have tried to convey, however poorly, by being less dogmatic.

It is a form of treatment all practitioners can apply—modified according to circumstances, though modifications carry their own risk of failure—and it will stand the light of day and the test of time. Incidentally, it will enormously reduce the risk of acute accidents such as appendicitis and chronic accidents such as tuberculosis, to mention but two out of a host of illnesses that take such sad and unnecessary toll of our children.

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ECTOPIC GESTATION

of the general peritoneal cavity by means of gauze and rubber pads. The anterior aspect of the tumour was then incised and a dead foetus removed. It was lying in a suppurating sac. The cord was divided. The pus contained in the sac was mopped up and the placental attachments inspected. The placenta appeared to be attached to that part of the sac which was adherent to intestine. It was decided to leave the placenta *in situ*. The edges of the sac were stitched to the abdominal incision. The rest of the abdominal incision was then closed and the sac lightly packed with gauze and drained with a rubber tube.

There was a slight degree of shock following the operation. The temperature fell to 97.4° , and the pulse-rate rose to 108° . On the following day the temperature rose to 101° , and remained above normal for about ten days. The pulse-rate varied between 90 and 110. There was a copious discharge of offensive pus from the wound. There was no abdominal distension. The placenta was discharged from the sac in two pieces on the fourth and sixth days after the operation. There was no bleeding. On the seventh day after the operation the patient developed a faecal fistula. As a result of this considerable difficulty was experienced in preventing the edges of the wound and the skin of the abdominal wall from getting sore and excoriated. In spite of the fistula the bowels acted well.

Progress.—Progress towards recovery was slow, but satisfactory. The faecal leak gradually closed and was healed by the middle of February 1928. She was discharged to a convalescent home on March 12, 1928, with a small discharging sinus in the abdominal wall which has since healed.

She is now in good health.

COMMENTS.

Diagnosis.—The first calamity that may befall a case of ectopic gestation is that an error in diagnosis may be made. It happened in this case before I saw the patient. The case was considered to be one of intra-uterine pregnancy with the retention of a dead foetus. I think the error was due to the fact that not sufficient care was taken in obtaining the history of the case. It cannot too strongly be emphasized that in many cases a complete and carefully taken accurate history goes a long way towards making a correct diagnosis. If due weight be given to the history of the case and to the physical signs, the diagnosis of extra-uterine gestation late in the second half of

and September she had several attacks of pain with much abdominal discomfort, but no vaginal bleeding. The attacks of pain only kept her in bed on two occasions, and then only for a day or two. Towards the end of August and the beginning of September she felt foetal movements in the abdomen. On September 25 and 26 she had a very severe attack of abdominal pains which felt like labour pains, and she says that on September 26 she felt the child struggle and die. She felt no more foetal movements. Since October the abdomen has decreased somewhat in size, and the breasts have got smaller. From November 12 to November 16 she had slight vaginal bleeding. Towards the end of November, as the abdomen and the breasts had decreased in size, and she had felt no foetal movements for at least two months, it was thought that the foetus was dead. It was calculated that normal labour should have started about November 2. The patient says that a dead child was diagnosed and a laminaria tent was inserted into the cervical canal. This laminaria tent was removed at the end of thirty-six hours, and, although there was some pelvic and abdominal pain following its introduction, the child was not born.

I saw the patient for the first time on November 29, and on examination found her condition as follows: She looked pale and ill, her temperature was 99.6° , and her pulse-rate 100. The heart and lungs were normal. The breasts did not look active, but some secretion could with difficulty be expressed from the nipples.

Abdominal Examination.—The abdomen was distended, especially below the umbilicus. Abdominal movements were restricted, especially over the left iliac fossa. There was marked tenderness and some rigidity of the abdominal wall below and to the left of the umbilicus. An abdominal tumour could be felt rising out of the pelvis to midway between the umbilicus and the ensiform cartilage. Its margins were well defined; above it felt partly solid and partly cystic. No contractions could be felt over it, and no foetal parts could be made out. It was dull to percussion. No sounds could be heard over it.

Vaginal Examination.—The cervix was situated high up and pushed forward by a mass in Douglas's pouch. The abdominal tumour could not be differentiated from the uterus.

X-ray Examination.—This showed the presence of a foetus.

Diagnosis.—A diagnosis of extra-uterine gestation was made, the foetus being dead.

Operation.—On December 20 an operation was done. The patient having been anaesthetized with chloroform and ether the abdomen was opened in the mid-line. The peritoneal cavity was opened and the abdominal tumour exposed. The tumour arose from the pelvis and had pushed forward the bladder and the uterus which had adhered to its anterior surface below. Some omentum was adherent to it above. The omentum was separated from the anterior aspect of the tumour; it was then packed off from the rest

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I saw the patient for the first time on November 29, and on examination found her condition as follows: She looked pale and ill, her temperature was 99.6° , and her pulse-rate 100. The heart and lungs were normal. The breasts did not look active, but some secretion could with difficulty be expressed from the nipples.

Abdominal Examination.—The abdomen was distended, especially below the umbilicus. Abdominal movements were restricted, especially over the left iliac fossa. There was marked tenderness and some rigidity of the abdominal wall below and to the left of the umbilicus. An abdominal tumour could be felt rising out of the pelvis to midway between the umbilicus and the ensiform cartilage. Its margins were well defined; above it felt partly solid and partly cystic. No contractions could be felt over it, and no foetal parts could be made out. It was dull to percussion. No sounds could be heard over it.

Vaginal Examination.—The cervix was situated high up and pushed forward by a mass in Douglas's pouch. The abdominal tumour could not be differentiated from the uterus.

X-ray Examination.—This showed the presence of a foetus.

Diagnosis.—A diagnosis of extra-uterine gestation was made, the foetus being dead.

Operation.—On December 20 an operation was done. The patient having been anaesthetized with chloroform and ether the abdomen was opened in the mid-line. The peritoneal cavity was opened and the abdominal tumour exposed. The tumour arose from the pelvis and had pushed forward the bladder and the uterus which had adhered to its anterior surface below. Some omentum was adherent to it above. The omentum was separated from the anterior aspect of the tumour; it was then packed off from the rest

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of the general peritoneal cavity by means of gauze and rubber pads. The anterior aspect of the tumour was then incised and a dead foetus removed. It was lying in a suppurating sac. The cord was divided. The pus contained in the sac was mopped up and the placental attachments inspected. The placenta appeared to be attached to that part of the sac which was adherent to intestine. It was decided to leave the placenta *in situ*. The edges of the sac were stitched to the abdominal incision. The rest of the abdominal incision was then closed and the sac lightly packed with gauze and drained with a rubber tube.

There was a slight degree of shock following the operation. The temperature fell to 97.4° , and the pulse-rate rose to 108° . On the following day the temperature rose to 101° , and remained above normal for about ten days. The pulse-rate varied between 90 and 110. There was a copious discharge of offensive pus from the wound. There was no abdominal distension. The placenta was discharged from the sac in two pieces on the fourth and sixth days after the operation. There was no bleeding. On the seventh day after the operation the patient developed a faecal fistula. As a result of this considerable difficulty was experienced in preventing the edges of the wound and the skin of the abdominal wall from getting sore and excoriated. In spite of the fistula the bowels acted well.

Progress.—Progress towards recovery was slow, but satisfactory. The faecal leak gradually closed and was healed by the middle of February 1928. She was discharged to a convalescent home on March 12, 1928, with a small discharging sinus in the abdominal wall which has since healed.

She is now in good health.

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pregnancy should not be difficult. When the foetus is dead and the extra-uterine gestation sac and its contents fill up the Douglas pouch and push the cervix high up and to the front, the possibility of an inflamed ovarian cystoma may have to be considered. An X-ray examination will show, in the later months of pregnancy, the presence of a foetus, as it did in this case. If the foetus has died, the decrease in the size of the abdomen with the absence of foetal heart sound, associated also with decrease in the size of the breasts, will all help in arriving at a correct diagnosis.

Treatment and Complications.—In the main, the treatment of a case of extra-uterine gestation resolves itself into the treatment of hæmorrhage, septic infection, and the shock which accompanies these two conditions. Internal hæmorrhage, in the case of ectopic pregnancy, may occur in the early months of pregnancy as a result of rupture of the tube or the gestation sac, and after the child has become viable it may be the most serious complication during or following an abdominal operation done in the treatment of the case.

The further the pregnancy goes on the more vascular the placenta becomes and the larger the area it covers, the more the bleeding when it is separated and the greater the difficulty in controlling it. In cases of ectopic pregnancy operated upon at or near term in which the foetus was living, a mortality of 88 per cent. has been recorded in a series of cases collected many years ago by Sir Francis Champneys. Very careful consideration must therefore be given to the case before advising operation at this stage as the mortality of operation will be considerable.

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In cases of ectopic pregnancy which are operated upon at full term, in which the foetus is alive, an attempt is made to prevent hæmorrhage by leaving the placenta undisturbed and hoping for thrombosis of the vessels and natural separation of the after-birth. The time of separation of a placenta left *in situ* is very variable; it may come away in three or four days or it may remain attached for several weeks. Rarely, a well-developed placenta has been found so attached to the Fallopian tube or uterus or omentum that the operator was able to secure all its blood supply by ligature with little or no loss of blood. A placenta developed outside the uterus may remain adherent in the same way as a placenta *in utero* whether it is dead or alive. The dead placenta may usually be peeled off with little loss of blood, but sometimes the removal of a dead placenta causes hæmorrhage.

In the case described in this article, as soon as any attempt was made at the operation to peel off the placenta, bleeding at once started. The after-birth was therefore left *in situ* to separate spontaneously. It is generally accepted that if the attachments of the placenta cannot be cut through and ligatured the proper treatment is to leave the after-birth to be thrown off by the tissues, the wound being drained to permit its escape. In this case the placenta was

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Practical Notes.

Alcohol in the Human Body.

W. D. McNally and H. C. Embree, from a large experience of analysing cases of alcoholism, have come to the conclusion that when alcohol is taken into the human body it is rapidly absorbed and passes to all the fluids and tissues of the body, so that within an hour and a-half it is practically all absorbed. An analysis of the blood, urine or tissue after that time will give a fairly accurate measure of the alcohol present in the body. Normally the human body contains about 0.003 per cent. of alcohol, and a chemical analysis showing alcohol to be present in excess of 0.01 per cent. indicates that alcohol has been taken recently. If the result is multiplied by the body weight, approximately the total quantity of alcohol taken can be ascertained, so long as the analysis is made within two to six hours after the alcohol has been taken. The authors state that the presence of 0.4 to 0.5 of alcohol represents a condition of drunkenness, and for a man of average weight this amount means that about 300 grams of alcohol have been taken (i.e. about a pint of whisky).—(*Archives of Pathology*, April, 1928, p. 607.)

The Treatment of Hæmorrhoids.

P. Lehmann recommends the employment of diathermy in the treatment of hæmorrhoids. Each hæmorrhoid, in contact with a diathermy needle, coagulates and eventually falls off. He states that it has the following advantages: The operation can be carried out at one sitting; the patient can be out of bed and back to work by the fourth to the sixth day; the wound does not become infected; although healing is slow the wound does not give rise to pain; there is no bleeding at the operation; the operation can be done under local anæsthesia or under a very short general anæsthesia.—(*Gazette des Hôpitaux*, July 11, 1928, p. 1002.)

The Treatment of Diphtheritic Paralysis in Infants.

P. Nobécourt observes that the feeding of infants suffering from diphtheritic paralysis presents difficulties, on account of the paralysis of the soft palate which is commonly present. Semi-solid foods are more easily swallowed than liquid ones, and the child can drink most easily when lying on its back. The passage of an œsophageal tube may be necessary. The curative action of anti-diphtheritic serum in this condition has been disputed, but Dr. Nobécourt is of opinion that it is of value and should be employed, injected subcutaneously; in order to avoid anaphylactic shock, a preliminary injection of 1 c.cm. of the serum should be given and the larger quantity should be injected very slowly. As regards drugs, strychnine sulphate and tincture of nux vomica, in doses

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The Treatment of Asthma and Hay Fever with X-rays.

P. Vallery-Radot, P. Gilbert, P. Blamoutier and F. Claude publish their results in treating asthma and hay-fever with X-rays, in a series of 64 cases. Of the patients 31 had asthma only, 8 had hay fever only and 25 had both diseases. In the majority of cases, both the hilum of the lung and the spleen were irradiated, receiving 10 to 12 treatments of ten minutes' duration each; in other cases only the lung or the spleen was irradiated. In 19 cases the attacks of asthma and hay fever did not recur after treatment, in 16 cases they were alleviated, and in 29 cases there was no improvement.—(*Annales de Médecine*, March, 1928, p. 214.)

The Treatment of Bronchial Asthma.

E. Schott, in dealing with the many remedies advocated for relieving the acute attack in bronchial asthma, favours the intravenous injection of both calcium and strontium salts, as the blood calcium is diminished just after an attack. Strontium is given empirically because of its close chemical relation to calcium; 10 c.cm. of a 10 per cent. solution of calcium chloride and 5 c.cm. of a strontium-urea compound are injected intravenously. The bronchial spasm is often relieved within a few minutes.—(*Deutsche Medizinische Wochenschrift*, June 8, 1928, p. 963.)

PRACTICAL NOTES

The Treatment of Dysmenorrhœa.

G. Léo puts on record 18 cases of dysmenorrhœa of a severe type which he cured by means of vermifuges, intestinal worms of various types being present in all of these cases (oxyuris 10 times, ascaris thrice, lamblias, trichomonas and trichocephalus twice each). Dr. Léo suggests that the intestinal worms cause dysmenorrhœa by disturbance of menstruation through enteritis and colitis, and perhaps also by the development of toxins with a harmful effect upon the whole system.—(*Revue Française de Gynécologie et d'Obstetrique*, March 1928, p. 142.)

Lipiodol and X-rays in Gynæcological Diagnosis.

F. Lee Stone is of opinion that as a means of determining tubal patency with a permanent clinical record, the injection of lipiodol and X-ray examination is a method with no equal. In a large group of sterility patients it might be possible, with the aid of radiograms, to determine when surgical relief is indicated. Anatomical or pathological alteration in the uterus and tubes can usually be palpated bimanually, but lipiodol and X-rays can aid in diagnosing functional conditions. The application is quite simple and practically free from any danger.—(*American Journal of Obstetrics and Gynecology*, May 1928, p. 662.)

The Treatment of Scarlet Fever.

J. E. Gordon, B. B. Bernbaum and L. C. Sheffield have employed scarlet fever streptococcus antitoxin in the treatment of 1,021 cases of scarlet fever who showed in general moderately severe or severe infections; a smaller group, 120 cases, all severely ill, received convalescent scarlet fever serum. They found that scarlet fever streptococcus antitoxin exerted a favourable effect in reducing the severity of the febrile stage of the disease, on the course and duration of the fever, and on the extent and duration of the skin lesions, while complications were less frequent. Judged on the basis of the case fatality rate and the percentage incidence of complications, there was no essential difference between cases of severe scarlet fever treated with scarlet fever streptococcus antitoxin and with convalescent serum; but the absence of serum reactions after convalescent serum makes it the more desirable.—(*Journal of the American Medical Association*, May 19, 1928, p. 1604.)

The Treatment of Urticaria.

E. E. Marcovici observes that while urticaria-like skin eruptions are very frequent and usually easy to correct when due to acute gastro-intestinal conditions, food-poisoning, anaphylactic reactions, diseases of the genital tract in the female, anæmia, hypochlorhydria or achlorhydria of the stomach, there are also types of chronic cases more difficult to treat, due to atonia of the cæcum leading to toxic reabsorption, and with a pronounced ptosis of the transverse colon. In the treatment of these cases the etiology will have to be considered and, as such, internal, causal and external symptomatic

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to the rim of the affected area. Very often the operator may be able to remove most of the necrotic material with a sharp curette, and then can loosely pack the cavity with some type of gauze. Thrombophlebitis and septicæmia are the result of late or inadequate measures.—(*New Orleans Medical and Surgical Journal*, June 1928, p. 807.)

The Treatment of Eczema with Hydrochloric Acid.

K. Scheer reports good results in 14 cases of infantile eczema from treatment with small quantities of hydrochloric acid given in milk. The acid is usually taken without trouble if thoroughly well mixed with the milk. A rapid improvement was seen in all but two cases, though these also eventually yielded to this treatment. It was generally found necessary to give the acid for from 4 to 6 weeks in order to effect a complete cure. Occasionally the passage of casts in the urine was noticed whilst the hydrochloric acid was being given, but this was unassociated with any signs of nephritis, was of no significance, and ceased immediately the treatment was stopped.—(*Münchener Medizinische Wochenschrift*, May 18, 1928, p. 852.)

Lichen Planus of the Tonsils.

M. Sydney Thomson reports a case of lichen planus of the tonsils, illustrated by a coloured drawing of this rare condition. The patient was a married woman, aged 33, who complained of pain on swallowing. The diagnosis of lichen planus of the tonsils was confirmed by the discovery of typical areas of hypertrophic lichen planus on the neck, scalp and left forearm; the buccal mucous membrane and tongue were quite normal. The patient's husband had previously been treated for a primary syphilitic sore, and she had had a generalized eruption which may have been a delayed papular syphilide. The lichen planus was treated by means of liq. hydrarg. perchlor. internally, together with half-strength lotio nigra as a gargle, and the throat condition was soon normal, although the hypertrophic skin areas did not disappear for some time.—(*British Journal of Dermatology and Syphilis*, May 1928, p. 191.)

Nasal Sinusitis as a Cause of Mental Disorder.

T. C. Graves insists on the important part played by nasal sinusitis as a cause of mental disorder. In a few cases of mental disorder under his care in which nasal sinusitis was suspected from clinical examination, the treatment was unavoidably delayed; during this period no improvement in the mental condition resulted, but it did follow later operative measures. Similarly, several cases of long-standing mental disorder have shown considerable improvement after the treatment of sinusitis. The author is now collecting reports concerning 50 cases of mental disorder treated for sinusitis and discharged. The reports are encouraging, especially as the cases are not early cases who voluntarily seek treatment, but are cases of certified mental disorder and generally long-standing disease.—(*Proceedings of the Royal Society of Medicine*, May 1928, p. 1267.)

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Reviews of Books.

Clinical Examination of the Lungs. Second Edition. By E. M. BROCKBANK, M.D., F.R.C.P., and ALBERT RAMSBOTTOM, M.D., F.R.C.P. Pp. viii + 112. London: H. K. Lewis & Co., Ltd. 5s. net.

THAT this little volume has fulfilled the purpose for which it was originally intended is proved by the fact that a second edition has now appeared. The book does not intend to be an exhaustive work on the subject; there are many such treatises already on the market, but in this case the task of the authors has been to present a short, concise and accurate account of the methods used in the clinical examination of the lungs. Simplicity may be said to be the keynote of this work, and it should appeal to a very large medical public, not only to the undergraduate student, but also as a stand-by and easy work of reference to the practitioner of medicine. The book is divided into seven sections, which deal with the anatomy and physiology of the lungs, subjective and objective signs, inspection, palpation, percussion, auscultation, and the final chapter is devoted to the physical signs of common pulmonary diseases. At the end, eight excellent radiographic plates have been included, which show the normal chest and the appearances which are present in common diseases of the lungs and pleuræ. The book can be confidently recommended.

Recent Advances in Diseases of Children. By W. J. PEARSON, D.S.O., M.D., and W. G. WYLLIE, M.D. Pp. 593. London: J. & A. Churchill. 15s. net.

THE distinguished authors of this volume have approached their task from a standpoint slightly differing from that of the authors of the textbooks in general use. Rather than produce a complete short treatise on the diseases of the child, they have chosen to apply the more modern knowledge of the general principles of medicine to the solution of the common problems of the practitioner who has to treat the sick child. Hence they embark on their venture with a somewhat lengthy chapter, which reviews some of the more general concepts of recent times on disease. This chapter has as a sub-title a phrase which has a touch of grandiloquence—a philosophy of disease; but in reality is a plea for a more extended application of the laws of sound physiology to the conditions of modern life. It is a chapter which reflects the general trend of the modern researcher, to return again to study of what our forefathers called the diathesis of the individual or the race, rather than to concentrate all our energies on the study of disease processes. The authors claim that they have often stated opinions rather than ascertained facts; but their opinions are, it seems to us, always worthy of serious consideration and would, we imagine, be re-echoed by the majority of their colleagues. The book is well printed and

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means have to be employed. Prompt and efficient evacuation of the intestines by means of a cathartic, especially castor oil or calomel, is necessary. After two days of fasting, a lacto-vegetarian diet should be prescribed, with the addition of easily digestible proteins such as boiled fish or chicken. In chronic cases Carlsbad water and a continuous use of intestinal antiseptics, such as menthol, salol, ichthyol pills, may be necessary. An abdominal support should be recommended in all cases with a pronounced colon ptosis. In some persistent cases of urticaria, blood-letting (200 c.cm. of blood being taken), followed by the infusion of a pint of warm physiological salt solution, is of advantage.—(*New York State Journal of Medicine*, June 15, 1928, p. 724.)

A Sequel of Injection of Alcohol for Neuralgia.

W. H. Rushton reports the interesting case of a clergyman, aged sixty-nine, who had alcohol injected into the left foramen ovale, for persistent and acute facial neuralgia, with complete success, the patient having had no recurrence of the tic. Twelve months later, however, he came back with his lower denture no longer articulating with his upper. When the jaws were approximated the lower bite had shifted about half an inch to the right of the corresponding upper, while when he opened his mouth the mandible descended to the left; his lower denture was remade to the altered bite. The reason for this sequel to the injection of alcohol is that, in injecting the left foramen ovale, the motor root of the fifth nerve is always paralysed, together with the sensory fibres, so that, besides weakness of the masseter and temporal muscles for the up-and-down bite, the external pterygoid is also paralysed; consequently, in opening the mouth, the lower jaw drops towards the left side, and in closing the jaw to bite the mandible is pulled slightly too far across to the right. Usually the motor root recovers very considerably, but in some cases the muscles do not recover.—(*Proceedings of the Royal Society of Medicine*, July 1928, p. 1624.)

The Place of Vaginal Cæsarean Section in the Treatment of Placenta Prævia.

E. Essen-Möller discusses the place of vaginal cæsarean section in the treatment of placenta prævia, and comes to the following conclusions. The vaginal cæsarean section for placenta prævia is a serious operation. The risk might, above all, be found in the possibility that the incision is not made sufficiently large to begin with and, therefore, might rupture further at the extraction of the foetus, especially if the mother is at term and the head large. There may be cases, however, where it is important to bring the labour to an end, although the cervix is not yet dilated, and where the abdominal cæsarean section is contra-indicated. In the opinion of the author, vaginal section in such cases deserves further trial before expressing a definite opinion as to its authorization or its indications.—(*American Journal of Obstetrics and Gynecology*, May 1928, p. 612.)

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Mental Disorders: A Handbook for Students and Practitioners.
By HUBERT J. NORMAN, M.B., CH.B. Pp. 463. Edinburgh:
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IN the preface to his volume Dr. Norman states that he is not sufficiently converted to belief in the latest theories as to adopt a revolutionary attitude to the past, and that he has been anxious to avoid controversial matters as far as possible. In accordance with these principles he has made but passing reference to the work and views of Freud and other exponents of modern psychotherapy, a course which must diminish the usefulness of his book to those who, without necessarily accepting these views, wish to know something about them. For the treatment of hysteria the author recommends change of environment, painful electric shocks, Weir Mitchell therapy, hypnosis and suggestion. Valerian should be tried, as "it is a pity to let old customs die," but psycho-analysis is "illogical" for a person already morbidly self-centred. The descriptions of the classic psychoses are clear and useful. The volume is well printed, and many of the illustrations are excellent.

Mechanics of the Digestive Tract. By WALTER C. ALVAREZ, M.D.
Second Edition. Pp. 447. London: Wm. Heinemann, Ltd.
31s. 6d. net.

IN addition to those who admired the first edition of Dr. Alvarez's work there should be a larger number of readers for the present volume, which has been so largely rewritten as to form almost a new work. The ideas of Dr. Alvarez are in many respects so revolutionary that it is impossible in the space of a review to give any description of them, but his book is the work of one who has given a lifetime to research and experiment, and all medical men interested in the alimentary tract and its disorders will read it with profound interest. In addition to his exposition of his theory of the gradients which influence the movements of the gut, the reader will here find an explanation of many of the phenomena of abdominal disease which have hitherto proved puzzling. Dr. Alvarez writes with the knowledge of one who has made a continuous study of the radiographic appearances of the living bowel, and this gives his work a practical value seldom to be found in the publications of purely laboratory workers. His description of the chemical composition of intestinal gases contains data which have seldom before been made accessible in medical literature, and these data have a scientific interest which should appeal alike to the exact and to the Rabelaisian mind.

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OCTOBER

1928

Mosquito-Control : General or Special ?

By SIR RONALD ROSS, K.C.B., K.C.M.G., F.R.S.,
M.D., D.P.H., etc.

Director-in-Chief, Ross Institute and Hospital for Tropical Diseases, Putney Heath ; Consultant in Malaria, Ministry of Pensions ; late Professor, Liverpool School of Tropical Medicine, etc.

I BELIEVE that mosquito-control was first tried in America for the general purpose of removing a nuisance ; but, of course, when it was found that certain mosquitoes carry filariæ and malarial fever, while others carry yellow fever and dengue, mosquito-control became of vital importance to public health in warm countries. So far as I can learn, I was the first to suggest mosquito-control against malaria, but in towns only, in a paper which was published in the *Indian Medical Gazette*, in July, 1899 ; and I repeated the suggestion at my inaugural lecture on the foundation of the Liverpool School of Tropical Medicine (*British Medical Journal*, July 1, 1899).

But at that time all my suggestions were met with the greatest incredulity ; no one could be persuaded to believe that mosquitoes could be controlled anywhere ; they were thought to be universally prevalent. A

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MOSQUITO - CONTROL

them, the world began to think I had recovered my sanity. But even then some said that we might be able to control the *Anopheles*, but not the *Culex* and *Aedes*, while many others held precisely the opposite opinion. Now the position is that we are justified in spending money to reduce the disease-bearing mosquitoes, but no others, and during the last thirty years there has been a tendency to advocate this point of view only. But is this a sound policy?

After all, mosquitoes are a great nuisance everywhere. A night spent in the presence of many mosquitoes may be as uncomfortable as a night spent in the presence of a baby or a tiger. There is much reason for controlling disease-bearing mosquitoes, but some also for controlling all mosquitoes.

I have heard people say that mosquitoes were invented by a certain personage in order to make men endanger their souls by swearing, and for no other purpose; and so I have always thought. The great question, now that we see that any kind of mosquito can be controlled if we take trouble enough and spend enough money, is whether we should do so for controlling all mosquitoes or confine our efforts only to the disease-bearing ones.

I wish to argue the point in this article, as best I can. It will certainly be cheaper in one way to deal only with the disease-bearing mosquitoes, but it may be more expensive in other ways. Nearly all recent papers treat chiefly of special mosquito-control for malaria or other diseases, as the case may be. There is at present an enormous production of papers on the subject. I gather that roughly about one-third of the deaths in malarious countries are directly or indirectly due to the disease; and that about one-third of the articles in journals of tropical medicine are devoted to the same subject. Probably no one on earth has ever really read all this mass of wisdom. It

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distinguished man of science actually said later that it would be as easy to control the air we breathe. In fact, my suggestions were generally ridiculed.

It was thought in India that I was proposing to control mosquitoes everywhere, all through the world, whereas my utmost hope was to reduce them only in crowded centres of population. At that time, too, all my teaching was much discredited. I was a mere Briton, while the Italians were alleged to have done all the work, and were the only persons to be trusted on the matter—though I had been studying mosquitoes since May 1895, years before anyone else thought there was anything in the subject. Of course, I had learnt something about malaria all this time and recognized that mosquito-control would cost money; but I also recognized (which few people have done) that malarial fever costs much more money in loss of labour and cost of treatment. That, however, was an idea which I could not get into the head of anyone. People not only thought that mosquitoes were universal, but also held that hospitals must be supported by sickness—without the sickness where would the hospitals be?

My original proposal was very modest indeed, and I wished only to attack the disease-bearing mosquitoes, and that in towns and villages, where our efforts would benefit the largest number of people for the same cost. Friends of mine protested even against these modest proposals, and thought I was disgracing the Liverpool School of Tropical Medicine by my opinions. In fact, that I was a mere crank. When, however, yellow fever was proved by the Americans to be carried by *Aedes*, and dengue was proved to be carried by those and other Culicine mosquitoes, I began to receive some occasional support; and when Malcolm Watson and Gorgas actually began to prove that mosquitoes could be diminished by diminishing

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It was thought in India that I was proposing to control mosquitoes everywhere, all through the world, whereas my utmost hope was to reduce them only in crowded centres of population. At that time, too, all my teaching was much discredited. I was a mere Briton, while the Italians were alleged to have done all the work, and were the only persons to be trusted on the matter—though I had been studying mosquitoes since May 1895, years before anyone else thought there was anything in the subject. Of course, I had learnt something about malaria all this time and recognized that mosquito-control would cost money; but I also recognized (which few people have done) that malarial fever costs much more money in loss of labour and cost of treatment. That, however, was an idea which I could not get into the head of anyone. People not only thought that mosquitoes were universal, but also held that hospitals must be supported by sickness—without the sickness where would the hospitals be?

My original proposal was very modest indeed, and I wished only to attack the disease-bearing mosquitoes, and that in towns and villages, where our efforts would benefit the largest number of people for the same cost. Friends of mine protested even against these modest proposals, and thought I was disgracing the Liverpool School of Tropical Medicine by my opinions. In fact, that I was a mere crank. When, however, yellow fever was proved by the Americans to be carried by *Aedes*, and dengue was proved to be carried by those and other Culicine mosquitoes, I began to receive some occasional support; and when Malcolm Watson and Gorgas actually began to prove that mosquitoes could be diminished by diminishing

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concern him, while the oil must not be wasted. In such cases, for a pennyworth of oil or labour, the neighbouring householder and his family may be persecuted for weeks by the mosquitoes that the distinguished scientist would *not* destroy, because they do not carry malaria.

Then again, if you are going to adopt special malaria-control, you must also employ highly trained men to distinguish the different kinds of mosquitoes, to know where they breed, and how best to control each kind. On the other hand, general mosquito-control requires little more than knowledge as to where mosquitoes of any kind are likely to be breeding and what to do with the water where they have been found. No highly trained entomologist or doctor, costing, say, £1,000 a year at least, will be demanded for the work, and the mosquitoes found by the above-mentioned coolie will be destroyed together with all others found anywhere, and the householder may be saved much danger to his soul, if not to his body.

I am beginning to wonder whether, if we consider the pay of the highly trained malariologist, special mosquito-control may not be really more expensive in the long run than general mosquito-control, which can often be supervised by any honest superintendent, who has received some, though not profound, instruction on mosquitoes. The special conopsologist will not like this opinion, and may, of course, find many faults in the work of his more humble brother; but his bill is likely to be larger, and possibly the place or the people living in the district are likely to receive even more benefit as regards comfort from the labours of the latter, though perhaps the local disease may not be reduced so markedly.

Another strong argument is as follows: We hear many statements to the effect that this or that species of mosquito carries only this or that kind of disease; but when we examine the scientific evidence behind the

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is difficult enough to study all the British and American articles only. Now that entomologists are helping us so largely, what we may call conopsology makes a very serious addition to the hard-worked doctor's field of study in the tropics.

Of course, I am not writing at all about mosquito-control for scientific investigation of any kind, or for studies of the habits of different species of mosquitoes. I am writing only about mosquito-control for the purpose of preventing mosquito-borne disease. Now-a-days, it is being undertaken actually to save towns, districts, plantations, villages and even houses from some disease. Generally, the money has been allotted solely for this purpose, and the people who have allotted it may not be interested at all in scientific results apart from the success of the campaign as regards disease-control.

Dissatisfaction is often expressed by those who give money for this purpose because much of it has been spent on making scientific observations, and not on reducing the disease only. If you say that to the entomologist or doctor in charge of the operations, he generally replies that his first duty is to learn the exact breeding-places of certain species of mosquitoes before tackling them. For that purpose he generally starts forth in the morning with an assistant, a dispenser and a string of coolies carrying bottles, nets, petrol-sprayers and perhaps books and maps, with the aid of which the great man will ultimately enlighten the world. But all that the person who gave the money cares for is to make a reduction in the cost of his labour forces, in the family allowances which he has to pay to sick coolies, and in hospital charges for the patients.

Too often, when a coolie runs up to the malariologist with a bottle full of larvæ, the latter exclaims that they are not of the right kind at all and therefore do not

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finding that certain *Culex* or *Aedes* do carry malaria after all. If that does occur, special mosquito control may have to be extended to other species besides *Anopheles*, and the efforts of the special *Anopheles* controllers will probably come to be laughed at.

Then again, the evidence against many kinds of mosquitoes carrying filariasis, yellow fever and dengue, beside the species usually blamed for this, is probably not to be so implicitly trusted as many people believe. I am quite ready to hear some day that a new yellow fever or dengue carrier has been discovered. Again, it will surely be safer to remove all these insects at one swoop if we can afford to do so. After all, mosquitoes are somewhat dirty feeders. Even if a species does not carry a specific disease it may give some septic poisoning by its bite. Every year cases of septic poisoning from mosquito-bite are alleged to occur in the English summer—if there is such a thing. It is probably just as inconvenient to die of septic poisoning as of malaria. That is another argument for reducing all mosquitoes at once if we can afford to do so.

The control of mosquito-larvæ involves three difficulties :

- (1) Difficulties of finding the breeding places.
- (2) Difficulties of killing the larvæ or of removing the breeding places.

Besides these difficulties, special mosquito-control also involves :

- (3) Difficulties of distinguishing the kind of larvæ dealt with.

All difficulties of any kind involve increased expense ; and, usually, the first of the above difficulties is perhaps the greatest of all. It is often by no means easy even to find the breeding places at all, though there are cases such as weed-covered tanks and lakes where the second difficulty often proves to be very great, that is, where

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statement we are not always so well satisfied of the certainty. For instance, I spent several years in searching for malaria-bearing mosquitoes, especially among *Culex* and *Aedes*, and failed in proving that any of them carry malaria. But still I am really not quite certain that they may not do so sometimes. For all I know they may require certain temperatures or certain kinds of food before the malaria parasites will develop inside them. Even I, who had really worked at the subject, was not satisfied that I had done everything possible with regard to these species. Generally, I used only laboratory temperatures and made no inquiries about food, etc.

Later on, of course, the Italian observers proved precisely the same thing "*indipendentemente da Ross*," although it can easily be proved out of their own mouths that they knew all about my work at the time; but as they concluded, again "*indipendentemente da Ross*," that *Culex* and *Aedes* do not carry malaria, we should remark that they must have examined under experimental conditions some scores of different species of mosquito all in the winter of 1898-9 and in the spring of 1899. That must have been a very remarkable piece of work even for three men to accomplish when working together. A poor solitary worker like myself may take years over a job; but these clever gentlemen seem to have obtained the same results independently of him in a few weeks. Personally, I do not believe that my work was sufficient or that their work was sound.

For quite another reason, which they never thought of, I consider it likely that only pool-breeding mosquitoes carry malaria; but a likelihood is not a certainty. Of course, many observers now maintain the same thing; but are we quite sure that they also have tested every possibility? I shall certainly not be surprised if someone some day succeeds in

Homœopathy : A System of Therapeutics.

By JOHN WEIR, C.V.O., M.B., Ch.B.

Physician in Ordinary to H.R.H. the Prince of Wales ; Physician to the London Homœopathic Hospital, etc.

I HAVE often been asked to explain what is meant by homœopathy and why I practise homœopathy. I practise it because, trained in the same medical schools as the rest of our professional brethren, some of us have stumbled up against homœopathy, and, struck by its extraordinary reasonableness, have put it to the test, to find yet additional power in the treatment of disease. Before now, doctors have set out to disprove the doctrines of Hahnemann—only to become their most devoted exponents. As Bier, the great German surgeon, says in a pamphlet that profoundly stirred medical thought in that country : “Had I started on these studies thirty years sooner, I should have been spared a great many errors and detours.”

Homœopathy is a system of therapeutics, founded on a definite law—*Similia similibus curantur* (Let likes be treated by likes). Medicine is concerned with the action of drugs and with the symptoms of disease : the problem being, how to apply the one for the relief of the other. It was Hahnemann who bridged the gulf with his Law of Similars. He says :

“It is only by their symptoms that diseases can express their need of help.”

“The morbid disturbances called forth by drugs in the healthy body must be accepted as the only possible revelation of their inherent curative power.”

“Drugs manifest no other curative power, except their tendency to produce morbid symptoms in healthy

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it is not so easy to destroy the larvæ even when found. My principal point is regarding the third difficulty, which may become a very serious one. If the conopsologist must distinguish the species of every larva before he kills it, he will have quite enough to do, and, as I have said, his bill is sure to go up.

I do not argue that it is *always* cheaper to use general mosquito-control than special mosquito-control. In many localities the breeding places are already known, so that the expenses of bonification will merely increase *pari passu* with the area dealt with. Local conditions may also favour either general or special mosquito-control, as the case may be.

The use of paris green seems largely to favour special *Anopheles*-control; but Dr. Menon, working in my laboratory, claims that by wetting the paris green before use he can cause it to sink, so as to poison other larvæ which feed at the bottom (*Journal of Tropical Medicine and Hygiene*, vol. xxx, No. 15, p. 193, 1927).

The man who sets out to control any mosquitoes at all must command sufficient labour and appliances for the purpose. My argument is that it may often be actually cheaper, because simpler, to control all the mosquitoes in a locality than to confine attention only to particular species. For many years past I have been in favour of general *versus* special mosquito-control, except where the former promises to be really much more expensive than the latter.

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Before discussing homœopathy, a brief word about its discoverer. Samuel Hahnemann was one of the great geniuses and patient investigators of the world. He was born in Saxony in 1755. At 12 years of age he was teaching Greek to a class at school. In medicine, hygiene, treatment of insanity, chemistry and metallurgy he was far ahead of his time. He is referred to by contemporaries as "this great analytical chemist" (Bradford), and chemistry still uses tests he worked out; and medicine, *inter alia*, owes him its black oxide of mercury. Of him that greatest of chemists, Berzelius, said: "That man would have made a great chemist, had he not turned out a great quack." In many ways he was twentieth-century. His "Materia Medica Pura" (1811) has infinitely more appeal for us than for the generation for which it was written. It was the result of twenty years' investigation and experience. His "Organon of the Art of Healing" (1810), in the words of an eminent bacteriologist, is the most up-to-date textbook on vaccine therapy. "Science," he says, "is now proving Hahnemann in detail . . . and to him should fall all the honour of having anticipated science by more than a century." At one period he renounced medicine, that he "might no longer incur the risk of doing injury, and engaged exclusively in chemistry and in literary occupations." This could not last, for Hahnemann was, above all, the physician. And so, in his extraordinary way, he resolved to investigate the whole question of medicine—in all languages. He set his soul to discover "If God had not indeed given some certain Law, by which the diseases of mankind could be cured." To this patient genius, the Law, in time, revealed itself; and to the elucidation of that Law he devoted his long life.

He says, in regard to his fundamental Law of Similars: "There have been physicians who had presentiments that medicines, by their power of producing analogous

persons, and to remove them from the sick."

"In order to cure gently, quickly, unfailingly and permanently, select for every case of disease a medicine capable of calling forth by itself an affection similar to that which it is intended to cure."

Homœopathy, then, means matching the disease picture of a sick person with some previously ascertained drug-disease picture, which drug is administered in dose only sufficient to initiate vital reaction, or, as Hahnemann puts it, "In doses so fine as to be just sufficient, without causing pain or debility, to obliterate the natural disease, through the reaction of the vital energy."

To his contemporaries these statements of Hahnemann seemed paradoxical to the verge of insanity; but the century that has passed has so changed the general conceptions of medicine as to bring it into line with Hahnemann. For instance, according to the Arndt-Schultz law, small drug doses stimulate cell activity, larger doses hinder it, still larger destroy it. This has been recently demonstrated in a beautiful manner by Sir Jagadis Bose. According to Schultz, when drugs are administered to healthy persons the symptoms they elicit are a revelation as to the cells and tissues they affect. Drugs that derange, damage or destroy certain cells in medium to large doses will stimulate the same cells if given in small doses. Disease symptoms are the expression of disordered cell and tissue activity, and their symptoms indicate the cells in need of stimulation. The ideal remedy will be the one which has produced similar symptoms on the healthy, so proving its power over precisely those cells affected by disease. On them, in minimal dose, it will act as a stimulus. And, as disease has made those particular cells abnormally sensitive, the stimulating dose must be very small indeed.

and record exact results, but to rule out errors. A prover would record his sensation when taking unmedicated powders and did not know when medicated powders were substituted, so that personal symptoms, unnoticed till his attention was focussed upon them, might be eliminated. All Hahnemann's work was thoughtful, painstaking to the last degree, and purely scientific. "A *Materia Medica*," he said, "should exclude every supposition, every mere assertion and fiction. Its entire contents should be the pure language of Nature, uttered in response to careful and faithful inquiry." Of such pure drug-provings the vast homœopathic *Materia Medica* is composed. In Allen's ten big volumes, "*Encyclopædia of Pure Materia Medica*," every symptom, whether of proving or poisoning, is marked with a number which refers not only to the authority but, where possible, to the exact dose responsible.

Occasionally a drug-disease presents an almost precise disease-picture, when that drug is practically specific: as belladonna for scarlet fever, mercury for syphilis, rhus for erysipelas, cyanide of mercury for diphtheria, *latrodectus mactans* for angina pectoris, corrosive sublimate for dysentery. But diseases do not affect all persons in precisely the same way, and the actual symptoms of the sick person have to be matched to get results. Single cases of scarlet fever will take on the malignant form, to which *ailanthus* better corresponds; and single cases of diphtheria may be without the mercury tongue and foetor, when *lachesis* or *lycopodium* may be better indicated.

During some fifty years Hahnemann was poisoning himself, his pupils, and his friends with remedies known and unknown, or known only to the ancients or the Arabians, in order to determine their exact, and especially their peculiar effects, physical, mental and moral. He proved one hundred medicines upon

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morbid symptoms, could cure analogous morbid conditions." And he quotes "the author of one of the books ascribed to Hippocrates," as well as sentences culled from half a dozen physicians of later times. But it was quinine that revealed the secret: "In 1790 I made the first pure trial with cinchona bark upon myself, in reference to its power of exciting intermittent fever. With this first trial broke on me the dawn that has brightened into the most brilliant day of the medical art: that it is only in virtue of their power to make the healthy human being ill that medicines can cure morbid states, and, indeed, only such morbid states as are composed of the symptoms which the drug selected for them can itself produce in similarity on the healthy."

An experience with belladonna carried him a step farther. In a house full of scarlet fever *one* child escaped—a child he was treating with belladonna. He knew that belladonna poisonings and scarlet fever present almost identical symptoms—dry, burning skin and throat, scarlet eruption, dilated pupils and throbbing headache. And homœopaths since his day have used belladonna as he thereafter used it, as prophylactic and remedy for scarlet fever, with a minimal mortality. Men who have worked through epidemics say that they never remember seeing the complications and sequelæ of scarlet fever in cases treated with belladonna. One of them has gone so far as to say: "Either I don't notify, or I don't give belladonna; the cases clear up so quickly that one gets into difficulties."

Once convinced of his premises, Hahnemann began "proving" drugs, i.e. testing their effects on "healthy but sensitive and susceptible human beings," and recording the symptoms they evoked, in order to use them "with confidence" in the treatment of the sick. His list of fellow-provers amounted to fifty—most of them medical men. Care was taken not only to elicit

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“The doses of the homœopathic medicines are invariably to be reduced so far that, after they have been taken, they will merely produce an almost imperceptible homœopathic aggravation.” And he says: “The doses of homœopathic medicine can never be too far reduced, provided that the dose, immediately after being taken, is capable of causing a slight intensification of symptoms of the similar natural disease.”

- (5) *Non-interference with vital reaction*: The necessity for waiting till the aggravation and the subsequent stage of amelioration is spent, before repeating the stimulus. This—in consequence of Wright’s work—is becoming generally recognized.
- (6) *Potentization*: Which “causes medicines to penetrate the organism, and thus become more efficacious and remedial.”

It will be observed that the small doses of homœopathy are no mere fad on the part of Hahnemann and his followers. They are necessitated for the avoidance of the severe aggravation where a homœopathic remedy—that is, the remedy to which the patient is supremely sensitive—is administered. Hahnemann says: “They produce the uncommon effects they do because they are not so large as to render it necessary for the organism to get rid of them by the revolutionary processes of evacuation”; and also because “The diseased parts of the body have become extremely susceptible of a stimulus so similar to their own disease.” Again, where homœopathy makes use of such remedies as snake poisons, the virus of diseases, and the deadly poisons that have always formed such an important part of our equipment, doses must be reduced. Ordinary textbooks are concerned with the maximum dose that may be given without danger; homœopathy

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himself. He wrote upwards of seventy original works on chemistry and medicine, besides his twenty-four important translations, which he embellished with much learned and original matter. Yet he lived to be 88 and died in full possession of his intellect and faculties. For forty years, we are told, it was his custom to sit up the whole of one night out of every four, working, translating, studying, writing in that fine, minute hand, beautiful and painstaking to the last.

As a result of his careful and prolonged investigations and experiments, Hahnemann taught the following:

- (1) *The administration of only "like" remedies:*

"A drug can only cure in virtue of its symptoms being similar to those of the case of disease; and here it could not fail to cure, in accordance with the eternal homœopathic law of Nature."

- (2) *The single drug:* Without which no scientific data on drug-action or estimate of curative drug-action can be determined.

- (3) *The single dose:* Repeated only in response to the demand of symptoms: i.e. in minutes to hours in acute and urgent conditions; but only in weeks to months in chronic diseases of slow pace.

- (4) *Initial homœopathic aggravation:* Now generally recognized—but only where such homœopathic remedies as vaccines have been used—as Wright's "negative phase." This homœopathic aggravation Hahnemann explains as the reaction of the vital force to the artificial similar drug disease "called forth in the diseased parts of the body by an excessive dose," diseased parts being hypersensitive to "like" drug action. With him it is "quite in order" and of good prognosis "if excited within proper limits." Therefore,

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only with the minimum dose that will supply the stimulus and start vital reaction. It is on vital reaction that the whole of Hahnemann's teaching and homœopathic experience are based.

By grinding down insoluble substances until they could be used as remedial agents, and in reducing his "like" medicines till aggravation became negligible, Hahnemann stumbled upon "potentization." Hahnemann claimed to be the first to make "This great and extraordinary discovery, that the properties of crude medicinal substances gain (when fluid by repeated succussion with unmedicinal fluids, when dry by frequent trituration with unmedicinal powders) such an increase of medicinal power, that when these processes are carried very far, even substances in which for centuries no medicinal power has been observed in their crude state display under such manipulation a power of acting on the health of man that is quite astonishing."

"Thus, pure gold, silver, platina, have no action on human health in their solid state—or crude vegetable charcoal, etc. . . . These substances are in a state of suspended animation as regards their medicinal action. But triturate one grain of gold leaf with 100 grains of sugar of milk, and a preparation results which has already great medicinal power." And by repeating this process again and again, "till the last preparation contains in every grain a quadrillionth of a grain of gold, it gives a medicine in which the medicinal power, latent and locked up in gold in its massive state, are so strikingly roused into activity" that a single dose will "change a miserable melancholic, loathing life and contemplating suicide, into cheerfulness and renewed love of life."

Medicinal substances are not dead masses in the ordinary sense of the term; their true essential nature is only dynamically spiritual—is pure force, which may be increased in potency almost to an infinite degree by that very remarkable process of trituration (and succussion) according to the homœopathic method.

It is with 30 small phials that Hahnemann's favourite "decillionth or 30th potency" is prepared. One drop from the strong tincture in No. 1 phial is shaken up with 99 drops of alcohol or water in

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No. 2, and a drop from this, in the same way, in No. 3 : and so on for 30 times to make the 30th centesimal potency.

Physical sciences teach that there are great forces (potencies) which are entirely imponderable, like light and heat. If only ponderables were real and imponderables unreal, then one of these seemingly insignificant doses would be, at worst, without effect. There is no agent, no power in Nature capable of morbidly affecting the healthy individual, which does not at the same time possess the faculty of curing certain morbid states.

Were Hahnemann alive in this age, to which he belongs, he would find confirmation in the pathological and therapeutic effects of X-rays and radium—"imponderables"—and, by their antagonistically malign and benign actions, perfectly exemplifying his Law. The chemistry of our day is more and more approaching Hahnemann, with its colloids and ions, its ferments and vitamins. The infinitely little is becoming the infinitely potent, and bulk and energy of particle are seen to be in inverse ratio. For infinite subdivision we may yet come to substitute Hahnemann's "dynamization" or "potentization." Chemistry has now its colloidal gold, silica, etc.; and while homœopathy warns us to be cautious with potentized silica for its power of breaking down scar tissue and liberating tubercle, non-homœopaths have demonstrated the power of silica to produce fibrosis of liver, kidneys, etc. Thus is Hahnemann every day finding confirmation.

Hahnemann, a hundred years ago, was already using products of disease for the cure of disease, and arguing that this was not isopathy but homœopathy: "Isopathy is to cure an equal disease by an equal miasm. The cure in that case could only be accomplished by opposing a similimum to a similimum, since isopathy administers only a potentiated and altered miasm to a patient." One of Hahnemann's valuable

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only with the minimum dose that will supply the stimulus and start vital reaction. It is on vital reaction that the whole of Hahnemann's teaching and homœopathic experience are based.

By grinding down insoluble substances until they could be used as remedial agents, and in reducing his "like" medicines till aggravation became negligible, Hahnemann stumbled upon "potentization." Hahnemann claimed to be the first to make "This great and extraordinary discovery, that the properties of crude medicinal substances gain (when fluid by repeated succussion with unmedicinal fluids, when dry by frequent trituration with unmedicinal powders) such an increase of medicinal power, that when these processes are carried very far, even substances in which for centuries no medicinal power has been observed in their crude state display under such manipulation a power of acting on the health of man that is quite astonishing."

"Thus, pure gold, silver, platina, have no action on human health in their solid state—or crude vegetable charcoal, etc. . . . These substances are in a state of suspended animation as regards their medicinal action. But triturate one grain of gold leaf with 100 grains of sugar of milk, and a preparation results which has already great medicinal power." And by repeating this process again and again, "till the last preparation contains in every grain a quadrillionth of a grain of gold, it gives a medicine in which the medicinal power, latent and locked up in gold in its massive state, are so strikingly roused into activity" that a single dose will "change a miserable melancholic, loathing life and contemplating suicide, into cheerfulness and renewed love of life."

Medicinal substances are not dead masses in the ordinary sense of the term; their true essential nature is only dynamically spiritual—is pure force, which may be increased in potency almost to an infinite degree by that very remarkable process of trituration (and succussion) according to the homœopathic method.

It is with 30 small phials that Hahnemann's favourite "decillionth or 30th potency" is prepared. One drop from the strong tincture in No. 1 phial is shaken up with 99 drops of alcohol or water in

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homœopathy was repealed in consequence of its startling success in the treatment of cholera. In England, in 1854 (according to a Report to the House of Commons), the mortality of cholera under ordinary treatment was 59·2 per cent., the homœopathic mortality being 16·4. And to this day the spirits of camphor of the chemists bears Rubini's name—Dr. Rubini, of Naples, being a homœopath who achieved amazing results in Italy during that cholera epidemic.

Hahnemann looked for his vindication to posterity: "My doctrines," he says, "in regard to the magnitude and repetition of the doses will be doubted for years, even by the greater number of homœopathic physicians. . . . I do not comprehend it, but facts speak for themselves. The truth of my proposition is demonstrated by experience, in which I have more faith than in my intelligence." "Is not truth eternal though it may have been discovered only an hour ago? . . . Was there ever a discovery or a truth that was not at first novel?" "It would be foolish to refuse to learn to write because we cannot understand how thought can be embodied in written words." "Does the physician risk anything by imitating a method which I have adopted from long experience and observation?"

"This doctrine appeals solely to the verdict of experience. 'Repeat the experiments,' it cries aloud, 'repeat them carefully and accurately, and you will find the doctrine confirmed at every step'; and it does what no medical doctrine, no system of physic, no so-called therapeutics ever did or could do—it insists upon being judged by results."

The quotations in this article are from Hahnemann's "Materia Medica Pura," "Organon" (Wesselhoeft's translation), and "Chronic Diseases." I am indebted also to the biographies of Hahnemann by Bradford and by Haehl, and to Professor Bier's "What shall be Our Attitude towards Homœopathy?"

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legacies is "psorinum" prepared from an itch pustule: "The psoric virus, by undergoing a process of trituration and shaking, becomes just as much altered in its nature as gold does," and "a powerfully acting agent." And from Hahnemann's day on, homœopaths have been using disease products for the cure of disease. The year 1831 gave us hydrophobinum ("lyssin") and variolinum (from smallpox); 1836, anthracinum (from anthrax); 1880, syphilinum ("luetium"), gonorrhinum ("medorrhinum"), bacillinum ("tuberculinum"). Burnett wrote in 1894: "There are but few (disease) viruses known to science that I have not used as therapeutic agents." That "nosodes" or disease products do act in homœopathic preparations and potencies, administered by the mouth, is a matter of daily experience with us. And the explanation of the fact that they do not get fatally changed during absorption may be that other fact, which Hahnemann demonstrated — namely, that substances highly potentized have laws of their own and are not subject to chemical neutralization.

Before an acute disease can be diagnosed, the remedy can often be selected, which is an immense advantage in shortening and modifying sickness. A disease expresses itself by symptoms; and where there are symptoms they can be matched and the "similar" drug administered without waste of time. Hahnemann, never having seen cholera, laid down the remedies that would be curative in that disease, the main ones being three: in early and simple cases, camphor (the strong tincture, one drop on sugar repeated every few minutes till reaction); in later stages, with excessive cramping, cuprum; or, with excessive evacuations and profuse cold sweat, veratrum alb. Cholera came to Europe, and the statistics of all countries where there were homœopathic physicians proved Hahnemann to the hilt. In Austria, the law interdicting the practice of

state of the mammalian intestine was compatible with normal existence. For eight days they succeeded in keeping alive and well a guinea-pig which had been obtained by Cæsarean section, confined in a sterile chamber, breathing sterilized air, and fed upon sterile milk. At the end of that time the animal was killed and the intestinal contents on microscopical and cultural examination were found to be free from micro-organisms. In this connection Levin studied the intestinal contents of animals in the Arctic regions (Spitzbergen); that is, of animals born in surroundings which naturally were almost as amicrobic as were the artificial ones in the case of Nuttal's guinea-pig. The digestive tract of white bears, seals, reindeer, eider-ducks, penguins, etc., were found in most cases entirely sterile. In one white bear and two seals examined, an occasional organism resembling the colon bacillus was found. In the Arctic zone the great rarity of micro-organisms in the air and the small number in the water (estimated at one organism for 11 c.cm. of water, while the Seine, in contrast, has 2,000,000 in the same amount) accounts presumably for the paucity of bacteria ingested and the consequent freedom from an intestinal flora. I do not know how far this subject has been pursued, but at least these observations suggest that an intestinal flora may not be entirely essential for healthy existence, though in civilized man high grades of health and activity are maintained *with* an intestinal flora.

To come nearer to my immediate subject, let it be said that, among others, Harvey Cushing and Arbuthnot Lane are responsible for the observation that the stomach and most of the small bowel are sterile in the healthy and fasting individual. W. D. Miller purposely introduced bacteria into the stomachs of animals and was able to demonstrate a progressive decrease in the number of recoverable organisms, so that after 9 hours

Gastric Infection Secondary to Oral Sepsis, and Systemic Disease.

By W. K. ANDERSON, M.D., F.R.F.P.S.G.

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IT may be useful as a preliminary to the consideration of the stomach as a focus of infection secondary to oral sepsis, to look at some physiological data. At birth the child is born with a sterile gastro-intestinal tract. Billroth is credited with being the first to observe that the meconium of the new-born infant is sterile and that micro-organisms appear with the first yellow stools. There are several theories as to how organisms first graft on to the intestinal contents, but the first obvious explanation is that they are carried in with the food. This hardly explains the source of *Bacillus coli communis* which appears to be among the first bacterial forms in the stools and remains, apparently, the only permanent inhabitant throughout life. I shall not stop to consider how far an intestinal flora bears upon digestion, or how it fluctuates with the variations in diet, carbohydrate or protein. Let it suffice to say that *B. coli communis* is an almost constant denizen of the lower bowel, and the streptococcus in various forms a common one, and that in health they generally occur there in a proportion of about 20 to 1.

It is of interest to notice that the sterile state of the infant gut at birth raised the question as to whether it could be maintained with health after birth. And in this connection Nuttall and Thierfelder attempted experimentally to determine whether this amicrobic

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no return was obtained. This sterilization is, of course, due to the bactericidal action of the hydrochloric acid secreted by the normal mammalian stomach. Much of our food certainly contains micro-organisms, but these, in the healthy individual, either get killed off in the stomach or pass through into the intestines with the food, and any that survive may go to modify the intestinal flora lower down. The experiments of Marfan and Barnard go to show that the healthy gastric mucus membrane is amicrobic and that only after artificial irritation by arsenic, and in pathological states, could micro-organisms be demonstrated occupying the mouths of the mucus glands.

In emergency operations on the fasting stomach, Cushing records the finding of the gastric mucosa in a sterile condition to bacteriological examination. He specially cites the following five cases:—

(1) Gastrostomy for peach stone impacted at the cardiac orifice of the stomach. No food for 12 hours.

(2) Gastrostomy for impermeable stricture of the œsophagus in an adult. Prolonged fast.

(3) Gastrostomy for impermeable corrosive stricture in a child. Nourishment refused for many hours.

(4) Gastrostomy for dilatation of œsophageal stricture in a child. Preliminary fast for 6 hours.

(5) Gastrostomy for impermeable traumatic stricture in an adult. No nourishment retained for many hours.

In all these cases, without exception, the small amount of material which could be obtained from the mucous surface of the stomach at the time of operation proved to be amicrobic on microscopical and cultural examination. Cushing goes on to observe that there is a tendency on the part of the stomach to completely free itself, together with end products of digestion, from even those micro-organisms which are resistant to the gastric juice, and consequently, to speak of the natural flora of the stomach is inappropriate since in its natural

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empty state in health the viscus becomes amicrobic. It would appear, then, that a stomach, normal in tone, emptying power, and hydrochloric acid secretion, has no micro-organisms growing on its mucous lining, and that only during food-content digestion or in pathological states are organisms to be found.

Infection of the stomach may arise in several ways. One is by intestinal stasis, often the result of constipation developed in childhood, persisting through adult life and giving rise to intestinal kinks with alimentary delay, which is so much emphasized as a fruitful source of many varieties of disease and disability. In these cases organisms usually confined to the large bowel ascend the gut until finally the stomach may become infected and remain a focus of infection. Again, it has been proven, as in the case of the cholera vibrio, for instance, that organisms in the blood can pass through the liver and be secreted with the bile, thereby passing into the duodenum *via* the common bile duct, and thus may infect the upper part of the alimentary tract, including the stomach.

It would appear from experience of all classes of ailments—medical, surgical, neurological, etc.—that microbes may enter the human host anywhere, and land anywhere. But it seems to me, from a concentrated experience of medical and mental cases over some years, that the stomach often passes unnoticed as an active focus of infection in a large number of instances, if not in the majority of cases, where the primary source of septic supply has been the teeth. The patient with septic teeth, especially the more painless forms of pyorrhœa alveolaris, has been swallowing pus for years. For a time the hydrochloric acid of the gastric juice keeps the growth of organisms in the stomach in subjection, and those that are not killed off pass through an active stomach without establishing themselves upon the gastric mucous membrane. But a time comes

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gias, obscure nervousness, infective heart disease, nephritis and even some types of insanity, such as confusion and depression, even to the extent of frank melancholia, I have been led to the infected stomach as the immediate source of the trouble—after the teeth. There is almost no clinical limit to the form which an infection of this kind may take. My usual procedure is that, whatever the complaint, the patient is thoroughly overhauled in a general way. In the absence of any other explanation of the source of the trouble, or where the teeth are defective or absent implying past defects, a fractional test meal for 2 hours with the Ryle tube and strained gruel is given. If the case shows achylia gastrica, a culture is taken by an Einhorn bucket on the empty stomach in the morning after a 12 hours' fast, so that no infection that could be attributed to food content of the stomach will complicate the issue. Bouillon is inoculated at the bedside and sent at once to the bacteriologist. This is done always after all septic teeth have been removed and the gums well healed, and in any case after the mouth has been thoroughly rinsed with permanganate of potash solution. The following representative examples of cases have been chosen from many treated in this way:—

Case 1. Severe Gastric Hæmorrhage.—F. A., aged 49. Admitted to the Eastern District Hospital 1/12/26 with history of vomiting blood—at least half a pint a time thrice within ten days. Has had indigestion off and on for twenty years. He had very septic teeth all that time, all of which were removed a year ago. He had two complete dentures on arrival. On admission to hospital he was very blanched and prostrate, and was fed with peptonized milk by the bowel for fully two weeks, then gradually by the stomach. Stools dark and blood-containing.

3/12/26. Blood estimation showed red cells 2,400,000, white cells 5,000, and Hb 18 per cent. The red cells stained badly and were fairly normal in shape and size.

29/12/26. Achylia gastrica.

10/1/27. Stomach culture streptococci xx, diplococci x, *Bacillus proteus vulgaris* x. He was put on HCl treatment.

15/1/27. Up a little daily for the first time, and progressing

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when an overtaxed stomach in the bacterial supply sense, gives way, the process of mucosal infection leads on to obliteration of the cells that secrete the hydrochloric acid, so that an early irritation stage with a hyperacidity of HCl passes through a stage of sub-acidity to one of total absence of HCl, otherwise known as achylia gastrica. This is commonly associated with the signs of acute or chronic gastritis with the changes that one would expect in an inflammatory gastritis—i.e. swelling and redness of the mucous membrane, leucocytosis, desquamated endothelium, the cells of the gastric glands cloudy-swollen and desquamated, the bloodvessels congested, and the presence of capillary hæmorrhages. The lymphatics also show desquamation of their endothelial cells, and gastric juice is diminished or absent. In long-standing cases there is an increasing fibrosis of the stomach lining going on to complete atrophy. The diminishing HCl, by progressive wiping out of the cells that secretes it, goes further to aggravate the condition, as the organisms thereby get an increasing hold upon the organ.

Crofton names as common in his experience of dental pus microbes belonging to the *Micrococcus catarrhalis* group and streptococci, staphylococci of various sorts, bacilli related to Friedlander's pneumobacillus and Gram-negative bacilli morphologically like the influenza bacillus. He has found *Bacillus fusiformis* in several cases. These organisms, swallowed for years in the subject with pyorrhœa, tend to lead to gastric infection, which, in turn, is a fruitful source of systemic disease, often enough long after the offending teeth have been removed. In my experience there is a large group of well-known syndromes, which appear to be directly related to stomach infection arising in this way. In my endeavour to explain some types of indigestion, certain types of asthma, diabetes, anæmias, purpura, clinical rheumatism, arthritis, general weakness, obscure neural-

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gias, obscure nervousness, infective heart disease, nephritis and even some types of insanity, such as confusion and depression, even to the extent of frank melancholia, I have been led to the infected stomach as the immediate source of the trouble—after the teeth. There is almost no clinical limit to the form which an infection of this kind may take. My usual procedure is that, whatever the complaint, the patient is thoroughly overhauled in a general way. In the absence of any other explanation of the source of the trouble, or where the teeth are defective or absent implying past defects, a fractional test meal for 2 hours with the Ryle tube and strained gruel is given. If the case shows achylia gastrica, a culture is taken by an Einhorn bucket on the empty stomach in the morning after a 12 hours' fast, so that no infection that could be attributed to food content of the stomach will complicate the issue. Bouillon is inoculated at the bedside and sent at once to the bacteriologist. This is done always after all septic teeth have been removed and the gums well healed, and in any case after the mouth has been thoroughly rinsed with permanganate of potash solution. The following representative examples of cases have been chosen from many treated in this way :—

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15/1/27. Up a little daily for the first time, and progressing

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favourably on full mixed diet. This is a case of gastric or pyloric hæmorrhage.

Note.—By achylia gastrica is meant no HCl, or a bare trace of it, while total acidity does not exceed 12, in titration with decinormal sodium hydrate. Lactic acid negative in each case. HCl treatment generally means 10 minims dilute HCl in half a pint of water, half an hour before each meal, increasing to 20 minims in some cases.

Case 2. Gastric Hæmorrhage.—Mrs. M., aged 50. Admitted to the E.D.H. 22/12/24. Gastric hæmorrhage severe the day before admission—arrived on a stretcher prostrate and blanched. Vomited blood twice after admission. Has had indigestion for six years—pain and vomiting. No natural teeth, and teeth very septic before removal. Fed by the bowel for two weeks, then slowly by mouth. About three weeks after admission test meal showed achylia gastrica.

23/1/25. Stomach culture showed streptococci and staphylococci and sporing bacilli. Put on HCl. She went home 14/2/25 feeling and looking well and on ordinary diet.

Case 3. Indigestion.—T. H., aged 36. Admitted to E.D.H. 1/12/24 with complaint of stomach pains for the past twelve weeks. He had some diarrhœa on admission, and was pale and toxic looking. His teeth were very septic and were removed on 3/12/24. Stomach very tender over lesser curvature, but otherwise negative. Wassermann negative.

19/12/24. Test meal showed achylia gastrica. Stomach culture showed numerous streptococci and a few staphylococci. He was put on HCl and went home 12/2/25 feeling and looking well and on ordinary diet.

Case 4. Diarrhœa with Cachexia.—Mrs. S., aged 56. Admitted E.G.H. 25/7/25. Illness began in June 1925 with sickness and vomiting. Since then diarrhœa has been persistent. Has become very thin and cachectic looking. No appetite. Abdomen, heart, lungs and kidneys negative. Septic teeth were removed soon after admission.

3/9/25. Achylia gastrica.

22/9/25. Stomach culture showed streptococci, non-pathogenic sporing bacilli and coliform bacilli (*B. acidi lactici*) a few.

Put on HCl and went home 19/10/25 free of diarrhœa and sickness, feeling and looking well, and on ordinary diet.

Case 5. Indigestion and Depression.—Mrs. G., aged 39. Admitted to Stobhill Mental Ward 22/5/26 as a case of depression.

History showed that she had stomach trouble for many years, and had been in various hospitals without much improvement in her gastric condition. No menses for twelve months. Several miscarriages. Has healthy children. Some days before admission she became frightened and worried about lack of income to the household. She became depressed, lost interest, stopped her housework and wept. No former history of depression. Physical signs negative, except a toxic look. Blood Wassermann negative.

Test meal showed achylia gastrica with an abnormal quantity

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of mucus. Teeth very septic and removed on 2/6/26. She went home a few days after this and was admitted to Duke Street on 19/7/26 with a slight recurrence of indigestion and mild depression after being at home since the above date.

16/7/26. Stomach culture shows streptococci and staphylococcus albus. She was put on HCl, rapidly cleared up, and went home well.

Case 6. Cirrhosis of Liver and Jaundice.—M. D., aged 35. Mental defective, boarded out on a farm, became jaundiced and was sent to Duke Street 8/5/25. No alcoholism or syphilis—Wassermann negative. No sickness or vomiting and no pain. Liver and spleen moderately enlarged.

10/5/25. Achylia gastrica.

22/5/25. Van den Bergh test showed mixed reaction, i.e. evidence for hæmolytic and obstructive jaundice. Very septic teeth, all of which were removed.

27/5/25. Stomach culture showed a vastly preponderating streptococcus with a very few staphylococci. HCl and autogenous vaccine led to improvement for a time, but he finally got worse and died, with ascitis and other evidences of cirrhotic liver. Post-mortem the liver showed a diffuse cirrhosis and cholangitis apparently due to the chronic infection of the liver, with atrophic gastritis, apparently secondary to chronic and severe pyorrhœa. Bile present and absent, by turns, in stools. Hanot's disease excluded.

Case 7. General Weakness, Anæmia and Body Pains.—Mrs. A., aged 44. Admitted E.D.H. 15/4/26, complaining of general weakness and generalized pains, especially in the back, of 4 weeks' duration. She had a uterine hæmorrhage at the beginning of January 1926, 14 days after the last menstrual period; has had 6 of a family, 3 now alive and well.

22/4/26. Blood examined showed red cells 1,800,000, white cells 6,000, Hb 20 per cent. Patient had no teeth, having had them removed previous to admission. Wassermann reaction negative.

28/4/26. Achylia gastrica.

4/5/26. Stomach culture showed streptococci in considerable numbers, diplococci many. Gram negative filamentary bacilli. She was put on HCl and went home some weeks later feeling very much better.

Case 8. Profound Anæmia.—Mrs. K., aged 52. Admitted to Duke Street Hospital 11/4/25, prostrate with weakness on a stretcher. She complained of weakness, breathlessness, sickness, vomiting and gastric discomfort. She looked exactly like a case of pernicious anæmia with a well-marked lemon tint of the skin, but the blood picture when worked out showed a profound simple anæmia. She had no teeth. Wassermann negative.

7/5/25. Red cells 2,134,500, whites 5,123, Hb 20 per cent. There was occult blood in the stools, and the question of malignant disease arose as the abdomen was slightly distended, tender, and rather doughy to the feel.

9/5/25. Gastric analysis showed achylia gastrica, and stomach

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culture gave: (1) A long chain streptococcus; (2) a short chain streptococcus; (3) *Staphylococcus albus*.

She was put on HCl, slowly and steadily improved, and has kept well ever since, keeping on the HCl up to date.

Seen and demonstrated to class at Duke Street, 5/6/27.

Feels and looks well and going on with HCl.

14/6/28. Still feeling and looking well, and continuing with HCl.

Case 9. Rheumatism, Anæmia and Heart Disease.—Mrs. C., aged 47. Admitted 12/3/25, with complaint of rheumatism of hands and shoulders and puffiness of the finger joints. Pale and toxic looking. Mitral and aortic endocarditis—such as might arise from organismal infection of some sort. No syphilis. No upper teeth, lower septic.

4/6/25. Red cells 3,976,250, whites 7,560, Hb 35 per cent. Teeth removed.

22/3/25. Test meal showed achylia gastrica. Stomach culture showed pure streptococci of two varieties: (1) Coccus—weak gram staining; (2) large coccus—with deep gram staining. Treated with HCl and went home 3 months later feeling and looking well.

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5/10/25. Test meal showed achylia gastrica: Wassermann negative.

7/10/25. Culture showed streptococci and staphylococci. Put on HCl and local methyl sal. to knees. She returned home feeling very much better.

Case 11. Purpura and Anæmia.—P. G., aged 55. Admitted 6/7/26 with extensive hæmorrhagic effusions into the subcutaneous tissues of both legs—most marked about right knee. Separate purpuric patches on thighs and legs, all of three weeks' duration. Profound anæmia. Red cells 2,180,000, whites 6,225, Hb 36 per cent.

10/7/26. His last 9 septic teeth removed. Achylia gastrica.

6/9/26. Stomach culture showed *Bacillus proteus vulgaris* in pure culture. Put on HCl.

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4/10/26. Red cells 3,225,000, whites 8,450.

GASTRIC INFECTION

7/10/26 and 11/10/26. Achylia gastrica on both occasions.

20/10/26. Stomach culture: (1) many streptococci; (2) many *B. proteus vulgaris*; (3) a few *B. paracoli*.

Put on HCl and went home in December feeling and looking rosy and well with skin clear.

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22/6/25. Culture—streptococci and *B. coli* in large numbers.

She was put on HCl and diabetic ladder diet.

4/7/25. Went home. No glycosuria and without insulin.

She keeps on with the HCl and diabetic diet.

30/5/28. Has kept in touch at intervals since last note. She goes on with HCl, has occasional slight glycosuria when she takes liberties with her diet, but is clinically well, free of her original complaints, and never needs insulin.

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8/5/25. Achylia gastrica. Wassermann negative.

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Had been ill for a year previous and in bed 3 months of that time. Wife died 3/12/25 while he was ill in bed.

He was transferred to E.D.H. 28/10/26 not confused, but still depressed. There was evidence of chronic bronchitis, emphysema and asthma. His teeth were very septic. Wassermann negative.

4/11/26. Sputum negative for T.B.

1/11/26. Achylia gastrica.

His teeth were removed early in December.

18/1/27. Stomach culture—staphylococci, *B. proteus* and a few streptococci. Put on HCl and was known to be well 15 months afterwards.

Case 17. Suicidal Melancholia.—Mrs. B., aged 33. Admitted to Stobhill Mental Wards 13/10/24, very depressed and was caught jumping over the window the day before admission. She had what was called rheumatic fever previous to admission and before admission had been confined to bed for 4½ months in a very depressed condition. On admission she had the fixed idea that she would never get better. Had two healthy children and health prior to this has been good. No family insanity and has no family worries.

Physical signs negative, except that she looked pasty and toxic and neurological overhaul was negative.

On admission she was very depressed and emotional—would get out of bed and lie on the floor weeping. She said that she did not wish to live and insisted that she would never get better. Blood Wassermann negative. She had a complete upper denture. A few septic lower teeth were removed. The remainder were good. Menses nil.

5/11/24. Complete achylia gastrica. Culture showed abundant growth of streptococci, staphylococci and diphtheroid bacilli. A vaccine was made of 50 mill. streps., 25 mill. staph., 25 mill. diphtheroids to 1 c.cm. She was given HCl before each meal. She slowly and steadily improved and went home on 28/3/25.

Seen on 29/4/25 she was still very well and menses had returned that week.

17/1/27. Reported well up to this date.

Case 18. Suicidal Melancholia.—A. McD., aged 55. 12/2/26. Admitted to Stobhill Mental Wards, very depressed and threatening to drown himself. His wife had been drinking heavily for years and he got worried. He has been confused and depressed. He is not of quarrelsome disposition. He took drink as a young man, but has not done so in recent years. Neurological signs negative.

17/2/26. Achylia gastrica.

18/2/26. Wassermann negative.

23/2/26. Stomach culture showed streptococci of which a vaccine was made. This was given in weekly doses with HCl before meals thrice daily.

24/3/26. Much improved physically and no longer depressed.

1/5/26. Home well, keeping on with HCl.

23/12/26. Visited—depressed again since stopping HCl 6 weeks ago. Has been depressed for the past 3 weeks.

GASTRIC INFECTION

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Case 19. Mental Confusion.—Mrs. C., aged 49. Admitted to Stobhill Mental Wards 2/10/24. This patient was in Gartnavel five years ago following a long period of sick nursing. At that time she had a delusion that she was going to be burned. On her discharge from Gartnavel she remained at home for two weeks, then disappeared, and was discovered seventeen months later in Edinburgh. She had been charing, but her husband could get no further particulars. She remained at home for ten months, then disappeared again for eight months. She had been living in a woman's home and going out charing. She stayed at home for seven months, then disappeared again, and a few days later was discovered by the police at Johnstone, and she was taken to Riccarton Asylum, where she remained for six weeks. Since her dismissal from there she has been very peculiar, and has tried to run away. She had a delusion that her money was bad. There is no family history of insanity, and systems appear normal. Wassermann negative. Her teeth had been very septic for many years, and had been removed before admission to Stobhill. She looked pale, pasty and toxic.

1/11/24. Achylia gastrica.

13/11/24. Abundant growth of staphylococci and streptococci in stomach culture.

18/11/24. HCl treatment began. Thereafter she made steady progress, delusions disappeared, she emerged from her confusion and depression, and her husband stated that he had never seen her so well either mentally or physically since she began to be ill five years ago.

15/4/25. Husband states that she remains well, attends regularly to her housework, and that when out with her shopping recently she took a normal interest in everything and looked like her old self. On April 1, 1925, a stomach culture gave a growth of staphylococci only, the streptococci having died out in the interval since the previous culture had been taken.

Case 20. Osteomyelitis of Femur.—W. R., aged 38. On admission the patient complained of pain and swelling of the left knee. The joint was swollen on admission and contained fluid. Scott's mercurial dressing was applied, and the swelling subsided so that no fluid could be detected in the joint. The patient still complained of pain above the knee, and presently the tissues there appeared swollen, red and very tender. One point in particular at the inner side of the lower end of the femur was very tender on pressure. X-ray showed a focus in the femur corresponding to the tender spot. The temperature was fairly normal, pulse a little quick. Enlarged glands appeared in the groin 13/12/26. Operation was performed by Mr. McEwen on December 14 and the following was found: The left thigh was much thickened in its lower third. The femur was drilled, and a sequestrum of dead bone was found with a little pus; that is to say, he had an osteomyelitis of the femur.

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It is worth noticing the following in this series of cases :—

(1) That streptococcus is the constant, and generally the predominant organism in the stomach cultures.

(2) That, often enough, the teeth have been long since removed when the patient comes to the doctor with whatever complaint there is.

(3) That, while indigestion in some form or another may be the sole or main object of complaint, often enough no complaint referable to the stomach is made, and that therefore it has to be thought of and investigated in relation to the ailment actually complained of.

(4) Lastly, when it is found to be infected and dealt with, the effects on whatever ailment with which it is associated, is generally beneficial, in whole or in part, according to the stage of the disease, and the usual variety of accompaniments that modify prognosis.

The infected stomach is, in other words, like the mole—burrowing surreptitiously and unobtrusively underground for long periods, and only occasionally showing its presence by outcropping here and there in a variety of syndromes to which its relationship may often pass unsuspected, and whose relief in consequence may remain partial or not at all, until the gastric infection, as well as its source of supply, the septic teeth, is dealt with, on some such lines as indicated above.

Diphtheria : The Present Position.

By GUY W. J. BOUSFIELD, M.B., B.S.

Director, Camberwell Research Laboratories ; Pathologist, St. Giles's Hospital, Camberwell, etc.

IN view of the large loss of life still caused annually by diphtheria, there would appear to be every reason for making an impartial review of the present situation as regards the treatment and control of this disease. It is only a matter of two years ago that an analysis of the death-rate in one London borough revealed the following terrible toll of young life : Of deaths from all causes in children under the age of fifteen years, 1 in 10 was caused by diphtheria. There was only one disease showing a higher mortality rate, and that was pneumonia, which was in many cases a secondary condition. It is not proposed to enter into a statistical discussion. Suffice it to say that a similar state of affairs still exists from time to time in various districts.

Many practitioners would express horrified surprise should one of their patients confess that he had not been vaccinated against smallpox; yet variola is a disease which may be reckoned as of little account when its statistics are compared with those of diphtheria today. To compare briefly : Smallpox is rare and now seldom fatal; diphtheria is common and often fatal. The modern immunological methods as applied to diphtheria are at least as efficient and rather more precise than those employed so successfully in the past in the control of smallpox. Abundant evidence in this country alone already shows that diphtheria immunization is far beyond the stage of experiment—it is both safe and

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(4) Lastly, when it is found to be infected and dealt with, the effects on whatever ailment with which it is associated, is generally beneficial, in whole or in part, according to the stage of the disease, and the usual variety of accompaniments that modify prognosis.

The infected stomach is, in other words, like the mole—burrowing surreptitiously and unobtrusively underground for long periods, and only occasionally showing its presence by outcropping here and there in a variety of syndromes to which its relationship may often pass unsuspected, and whose relief in consequence may remain partial or not at all, until the gastric infection, as well as its source of supply, the septic teeth, is dealt with, on some such lines as indicated above.

Diphtheria : The Present Position.

By GUY W. J. BOUSFIELD, M.B., B.S.

Director, Camberwell Research Laboratories ; Pathologist, St. Giles's Hospital, Camberwell, etc.

IN view of the large loss of life still caused annually by diphtheria, there would appear to be every reason for making an impartial review of the present situation as regards the treatment and control of this disease. It is only a matter of two years ago that an analysis of the death-rate in one London borough revealed the following terrible toll of young life : Of deaths from all causes in children under the age of fifteen years, 1 in 10 was caused by diphtheria. There was only one disease showing a higher mortality rate, and that was pneumonia, which was in many cases a secondary condition. It is not proposed to enter into a statistical discussion. Suffice it to say that a similar state of affairs still exists from time to time in various districts.

Many practitioners would express horrified surprise should one of their patients confess that he had not been vaccinated against smallpox ; yet variola is a disease which may be reckoned as of little account when its statistics are compared with those of diphtheria today. To compare briefly : Smallpox is rare and now seldom fatal ; diphtheria is common and often fatal. The modern immunological methods as applied to diphtheria are at least as efficient and rather more precise than those employed so successfully in the past in the control of smallpox. Abundant evidence in this country alone already shows that diphtheria immunization is far beyond the stage of experiment—it is both safe and

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abundant pure growth of staphylococcus aureus. Gastric analysis showed a definite subacidity.

18/1/27. Stomach culture. Staphylococcus aureus and streptococci. Progress good up to date. Home about beginning of June 1927. Walking, wound nearly healed, and on HCl. Demonstrated to class 5/6/27, having come up from home on purpose.

It is worth noticing the following in this series of cases :—

(1) That streptococcus is the constant, and generally the predominant organism in the stomach cultures.

(2) That, often enough, the teeth have been long since removed when the patient comes to the doctor with whatever complaint there is.

(3) That, while indigestion in some form or another may be the sole or main object of complaint, often enough no complaint referable to the stomach is made, and that therefore it has to be thought of and investigated in relation to the ailment actually complained of.

(4) Lastly, when it is found to be infected and dealt with, the effects on whatever ailment with which it is associated, is generally beneficial, in whole or in part, according to the stage of the disease, and the usual variety of accompaniments that modify prognosis.

The infected stomach is, in other words, like the mole—burrowing surreptitiously and unobtrusively underground for long periods, and only occasionally showing its presence by outcropping here and there in a variety of syndromes to which its relationship may often pass unsuspected, and whose relief in consequence may remain partial or not at all, until the gastric infection, as well as its source of supply, the septic teeth, is dealt with, on some such lines as indicated above.

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that the patient is actually suffering from the much-dreaded diphtheria. Up to this point, then, a swab may have only proved a source of confusion, and in any case there has been a delay in vital treatment.

The difficulty of the swab is by no means disposed of. The microscopist finds morphological diphtheria bacilli in his culture, and has to report at once. No time is available for him to make adequate investigation, which is a task extending over several days. By the time that was completed the patient would be either better, or on the high road to paralysis or Paradise. Yet that same positive finding may signify one of several things. If the patient is susceptible, he may have a true attack of diphtheria, the bacilli being true virulent diphtheria bacilli. Alternatively, the organisms found may be true virulent diphtheria bacilli, but the subject is immune to diphtheria. In this case the throat condition is probably due to some other organism such as a streptococcus, and the patient is actually only a "diphtheria carrier" discovered in the course of another disease.

In a further class of case the organisms found may be diphtheria bacilli; but they may be quite avirulent and not capable of producing disease in other human subjects or laboratory animals. Finally, the bacilli may not be true diphtheria bacilli at all, but may be merely members of allied or morphologically similar groups, presenting almost indistinguishable microscopic appearances. Yet in all the above cases the bacteriologist can only issue a positive report. He is usually too wise to enter into the question of possibilities or probabilities when the matter can only be decided after the passage of some days.

It must not be imagined that the swab has not a useful place in the control of infection. Carefully taken and carefully examined, swabs will always form a part of the first line defence in dealing with

efficient.

The fallacies of the old methods of dealing with diphtheria are abundant; yet these methods are still relied upon to an almost unbelievable extent in view of the advances which have been made in recent years. One of the greatest difficulties in dealing with the disease is the early differential diagnosis of the faucial lesions from those caused by Vincent's angina, streptococci, pneumococci, and a number of other micro-organisms. Even a very experienced practitioner is often unable to make a definite diagnosis, and in the majority of cases a swabbing is taken to decide the question. This commences a pernicious cycle: it may happen that the swab is difficult to obtain from a small patient, and that it does not represent a true sample of the material. Again, the superficial infection may be largely a coccal one, with the diphtheria bacilli so "diluted" by other organisms that a positive culture cannot be obtained. It may be that the infection is a laryngeal one, and that the bacilli are not to be found in a throat swab. Also, swabs may be contaminated with freely-growing air organisms, which may prove fatal to a satisfactory examination; and, finally, something may occasionally go wrong with the cultures themselves in the laboratory, even though the swab was a satisfactory one.

In any of the cases mentioned above a negative bacteriological report may result, though the patient may, in reality, be suffering from diphtheria. The danger of relying implicitly on the results of swabs cannot be over-emphasized, especially in laryngeal cases. Rational treatment demands the administration of antitoxin to the patient promptly in any case of doubt. In a good-class practice there is usually no difficulty about this, but in the poorer districts the injection of antitoxin is not well tolerated by the friends unless the medical attendant can assure them

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technical aspect of diphtheria immunization. The subject is not one which can be treated satisfactorily in an article, as most of the difficulties that arise can best be appreciated and overcome by practical demonstration and by experience. In most cases, before commencing immunization it is advisable to determine the susceptibility of the subject by means of the Schick test. Briefly, this consists of the intradermic injection into the skin of the left forearm of 0.2 c.cm. of diluted diphtheria toxin. A similar amount of previously heated diluted toxin is injected into the right forearm as a control. The injections are almost painless, and there is rarely any difficulty in giving them even to very small children.

For a description of the readings of the test, it is best to refer to standard literature on the subject, and then verify the impressions obtained by observation of as many actual readings in practice as occasion permits. Suffice it to say that if a hyperæmic or desquamating patch appears on the left arm, and shows a tendency to persist after several days without the persistence of any patch on the right arm, the patient is Schick-positive and, therefore, susceptible to diphtheria. Subjects producing no reaction at all in the left arm are immune and require no treatment. Having determined the susceptible subjects in a community, the immunization of these can in nearly every case be effected by an absolutely safe and simple method.

Experience appears to show that the best material to use is the toxoid-antitoxin mixture prepared in this country by Burroughs Wellecome. The method of administration is by deep intramuscular injection of 1 c.cm. of the preparation, usually into the deltoid. This injection is subsequently repeated twice at intervals of one week, the dose being in each case 1 c.cm. This completes the immunization treatment. It is

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diphtheria. The evil occurs when, as is still too often the case, the practitioner leans on the bacteriologist for the diagnosis before commencing treatment. The latter position is not strange, however, when it is realized that the Metropolitan Asylums Board will not remove cases suspected of being diphtheria. The doctor must either wait for a positive swab to issue his request for removal, or he must perjure himself by issuing a false certificate in all those cases where he is in doubt. The alternative is that the patient remains at home, often in a crowded house, a danger to those around him, and often awaiting the vitally necessary antitoxin until admission to hospital is secured. Non-diphtheritic patients with other faucial infections who are certified as diphtheria, and removed to hospital, run grave risk of contracting diphtheria during the period of their stay there.

Diphtheria is a disease the rapid and certain diagnosis of which is often impossible; yet it is delay in treatment which permits the terrible toll of young life to be taken annually by this infection. One more potent factor in poor class districts is that the practitioner is frequently not called to the patient until the disease is firmly established, or there has been a croupy cough for a day or two. The latter case needs no comment. The disastrous sequelæ are too well known and dreaded by parents and practitioner alike.

It is contended, then, that the whole position is at present eminently unsatisfactory. Diphtheria cannot be fought and held on these lines. The position is that the enemy is being attacked with an air-gun when tried and proved heavy artillery lies practically unused in reserve. Safe diphtheria immunization is an accomplished fact, and the weapon to destroy diphtheria is at the disposal of the profession and the public when they are prepared to use it properly.

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now necessary to wait for three or four months for the full effect to be developed by the body. The somewhat tardy effect of the treatment may be open to criticism, but experience has shown that, once established, the immunity appears to last for at least five years in the majority of cases. This suffices to carry children over the period of greatest danger, i.e. young and middle school age.

It is essential that a person who has received the three injections of toxoid-antitoxin should be re-Schick-tested about four months later, to ensure that the original Schick-positive reaction has been changed to a Schick-negative one at the subsequent test; for experience has shown that three injections are not always sufficient to produce the desired result, a percentage of children requiring four, five, or even six doses of the material to render the Schick reaction negative. In most cases, however, the three injections effect the end in view. It is also recommended that persons who have been rendered immune should be advised to come for a further Schick test after a few years (after the manner of re-vaccination), as, if the immunity appears to be waning, it may be renewed easily by a further injection or two.

At this point it is important to emphasize that the mixture prepared in this country is absolutely safe. The profession and the general public must be made to understand clearly that this material is totally different from those products which have caused fatal illness in America, Austria and Australia. The British product is carefully checked for safety throughout the various processes of manufacture, and, as issued for use, contains no diphtheria toxin. It is the use of the latter element in foreign mixtures that has caused the trouble which more than anything else has put back the advance of active immunization, by creating a sense of insecurity in the mind of the public and the profession.

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A burden of moral responsibility lies at the door of the Press who report these fatalities that have occurred abroad if they do not simultaneously make it clear that such a thing cannot happen in this country. Until such time as the profession and the public fully realize the safety and advantages of the modern methods, heavy and unnecessary annual loss of life from diphtheria will continue. This disease, as a factor in our records, could be practically exterminated in the space of a few months if the nation so willed it. Some responsibility appears to rest at the moment with the higher health authorities. For some time these bodies have been content to give the modern methods their blessing, and to sanction the institution of free voluntary clinics and the distribution of literature in the schools. The matter cannot be dealt with satisfactorily by these piecemeal and very extravagant tactics. Whole schools should be immunized *en masse*, except in the case of conscientious objection. Where this has been done, in the writer's personal experience, an institution previously riddled with diphtheria has been rapidly cleared and kept free of the disease.

No child who has been through a complete course of immunization has died of diphtheria in an experience covering some thousands of cases. One child considered to be immune developed an extremely mild attack of true diphtheria, which was self-curative in the course of a few days without the administration of diphtheria antitoxin. The child was allowed up within a week, and there was no subsequent paralysis or cardiac complication. In the above instance the attack was instituted by a very virulent strain of diphtheria bacillus, so that a temporary breach in the child's defences was effected; but as the patient had sufficient antitoxin of his own in the circulating blood, derived from his previous immunization, he was able to

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The Fowler Posture and Tube Drainage: A Criticism.

By RUTH ELIZABETH MILLAR, F.R.C.S.E.,

AND

GEORGE ROBERTSON, F.R.C.S.E.

Honorary Surgeon, Dunfermline and West of Fife Hospital.

IN nearly every surgical hospital the Fowler position and the "Murphy drip" are daily advocated as correct up-to-date methods in the post-operative treatment of acute abdominal conditions. The present writers will try to show in this article in *THE PRACTITIONER* that these two methods are bad companions, and especially that the Fowler position is a strong surgical delusion and a dangerous snare. The "Murphy drip," more technically described as continuous proctoclysis, is, on the other hand, a triumph of common sense. Dr. Murphy was a clear thinker, and his "drip" method will live, and rightly so, in surgical after-treatment for many a day; for the benefits derived by the patient are very great indeed. We reluctantly admit, however, that many surgeons employ the "drip" with discomfort instead of benefit to their patients, owing to a complete disregard of the elementary principles of hydrostatics; and it is just this type of surgeon who blindly persists in the use of the Fowler posture.

It is contended that if the toxic, shocked patient is caused to assume the sitting posture or any similarly inclined position of the body from above downwards—modifications of the Fowler position—all will be well

overcome the infection and neutralize all the toxins without assistance. This patient was far less ill constitutionally than if he had been the subject of one of the lesser throat infections.

Let it be finally stated that fatal diphtheria, laryngeal or faucial, with a very few exceptions, need not exist today. The profession has a grave responsibility in making sure that members of the public realize this, and that if the latter seek protection they need have no fear that they are incurring any sort of risk during the treatment. This has not yet been made sufficiently clear. Foreign failures have been given wide publicity, while British successes have been allowed to hide their light under the proverbial bushel measure.

If the population is educated to create the demand, the public bodies will not hesitate to supply the facilities. It does seem that in the matter of approaching diphtheria as a national question our higher health authorities carry the policy of *festina lente* a little too far. At the same time much can be done by the practitioner to help, if he will only pass on the message to the public. It is in our hands to render diphtheritic infections, with their fatal complications and disastrous sequelæ, as rare as smallpox has been rendered in our time.

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concerning absorption of toxins from the peritoneum, visceral, parietal, "silent," or "demonstrative." To add insult to injury, this posture is very commonly associated with what is termed suprapubic "drainage" of the pelvic cavity. Surely nobody believes that fluid will rise against gravity from a basin like the pelvic cavity just because a tube lies there? Siphonage can empty the pelvic basin, but suprapubic "drainage" as employed in our hospitals is not siphonage.

In the Fowler position the small intestines gravitate to meet the suprapubic tube; and with what affection they embrace and caress it and the traumatized aperture in the peritoneum through which the tube passes, all must know from sad past experience. Let the proved clinical facts of an acute abdominal lesion be examined, and let the history of a case from the onset of the catastrophe—the visceral perforation—be considered. It will be found that the patient, in the vast majority of instances, assumes the flat, supine posture very soon after the accident. Thus he remains, until diagnosed, throughout his transport to hospital, throughout his operation, and in bed in the ward until he has recovered from the anæsthetic. During these many hours the escaped visceral content and the immediate exudative response of the peritoneum flood the abdominal cavity.

In upper abdominal lesions, e.g. the common duodenal perforation, the right kidney pouch fills to the extent of a pint and a-half or more of fluid; when full, it overflows along the right paracolic gutter, past the caput cœci, and thence into the pelvic cavity, which it may also fill. This takes quite a considerable length of time—usually twelve hours or more. In some cases, where the patient's shoulders have been propped on pillows, a considerable proportion of the fluid will have reached the pelvis; but, even in these, the right kidney pouch will be found to contain quite

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a large quantity.

From our own experience, and from reports of the published technique of others, we have no hesitation in stating that the first part of the operative procedure should be the removal of fluid from the right kidney pouch and pelvic cavity. Thus will the perforation be easily seen, cleanly sutured and infolded, and, if necessary, barricaded by an omental graft. To suture the ulcer and barricade in a pool of fluid, rising and falling with the deep respiratory movements of the patient, is difficult and foolish; to cleanse the infected pouches after the delicate suturing of friable gut and omental graft subjects the field of the operation to strain. The fluid is mopped by gauze swabs dipped lightly into the flooded areas and as lightly withdrawn. The kidney pouch is easily mopped dry. An ounce or two of fluid left in the pelvis need not concern the surgeon. The right pararectal incision should be used, should be of ample length, and its lower end should reach the umbilicus. It should be closed in layers, as in a clean case; with this precaution that, the peritoneum closed, these layers should be carefully swabbed with acriflavine solution. Thus, primary union may be confidently expected.

The complete operation need not take more than twenty minutes if a good anæsthetist presides at the head of the table. No drainage tube, suprapubic, flank, vaginal, etc., should be used. The patient, after return to bed, should be laid flat and supine; the head pillow should be low. Having recovered from the anæsthetic, he or she may be given a second soft pillow; but neither the Fowler position nor any modification of it should be adopted.

By the uniform adoption of these methods, operative and post-operative, the writers have, in cases where recovery was reasonably possible, been most successful, and even in those early cases where an immediate

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gastro-jejunostomy completed the operative treatment, have safely dismissed the patient from hospital in less than two weeks from the date of admission. Pyrexia, tympanites, abdominal pain and other accompaniments of the "drained" abdomen have been conspicuous by their absence.

In a criticism of this nature it is easy for the writers to understand how the suggestion of the Fowler posture and suprapubic drainage became the religion of an army of surgeons. There is something impressive in the picture of the severely inclined patient whose abdominal cavity is filled with a supposedly dangerous exudate leaking steadily to the body surface via a suprapubic tube. Moreover, it was once our religion, until experience and careful consideration showed us its falsity. Surgery is full of hypnotic practices. There are those who maintain that the fluid found upon opening the abdomen in these perforative cases is sterile bacteriologically. With that we cannot agree, but admit that its toxicity is low. If it be sterile, then why, we ask, do these same authorities advocate its drainage?

We believe that the original exudate, composed of visceral content *plus* peritoneal response, is toxic; that once removed and the toxic source eliminated it is followed by a second exudate which is not only sterile bacteriologically, but highly antitoxic as well—an exudate to be conserved for the patient, not drained away, even if that were possible, suprapublically. It is common knowledge that the intestines crowd round the drainage tube, and that the presence of adhesions, wonderfully quickly formed, soon deny the "drain" its power to even leak. Such is Nature's protest, albeit a dangerous one, when the small intestines play a prominent part and adhere to the aperture in the peritoneum through which the tube is inserted and from which it is finally withdrawn.

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It is believed that the high pouches of peritoneum, diaphragmatic, etc., are the most rapidly absorptive of the exudate and toxin, the low pouches the slowest—a Fowler argument; yet it must be remembered that the danger areas are just those which are the most extensively flooded in the early hours after perforation, and that only too frequently does one find, upon being called to a patient as late as twenty-four hours after perforation, that the pulse-rate is hardly accelerated.

There are many clinicians who still maintain that marked shock immediately follows a visceral perforation. This is exceptional in our opinion; but the operation necessary for the relief of the patient does produce a variable degree of shock which is present during those early post-operative hours when the head high position is part of the Fowler posture. All other forms of surgical shock are treated in exactly opposite posture.

The highly toxic lesions of the lower abdomen, of which acute appendicitis is the most grave, localize themselves to the lower abdomen for a long period. When pus travels upwards along the colic gutter to the perinephric space and towards the diaphragm, it does so, not in defiance of the laws of gravity, but because, owing to the anatomical position of the viscus, usually retrocecal, and the development of the new adhesions, it has no other alternative but to travel in the line of least resistance. The Fowler position is of little, if of any, use even in these cases. The following is a recent case of some interest in this regard :

A young man was operated on eight hours after the onset of acute abdominal symptoms. A fairly large perforation of an ulcer of the anterior aspect of the first part of the duodenum was found. The right kidney pouch contained more than a pint of bile-stained fluid. The appendices epiploicæ of the hepatic flexure and transverse colon and the fat in the gastrocolic omentum showed numerous areas of definite fat necrosis. The operator's finger, passed through the foramen of Winslow, released a quantity of fluid

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There are many clinicians who still maintain that marked shock immediately follows a visceral perforation. This is exceptional in our opinion; but the operation necessary for the relief of the patient does produce a variable degree of shock which is present during those early post-operative hours when the head high position is part of the Fowler posture. All other forms of surgical shock are treated in exactly opposite posture.

The highly toxic lesions of the lower abdomen, of which acute appendicitis is the most grave, localize themselves to the lower abdomen for a long period. When pus travels upwards along the colic gutter to the perinephric space and towards the diaphragm, it does so, not in defiance of the laws of gravity, but because, owing to the anatomical position of the viscus, usually retrocecal, and the development of the new adhesions, it has no other alternative but to travel in the line of least resistance. The Fowler position is of little, if of any, use even in these cases. The following is a recent case of some interest in this regard :

A young man was operated on eight hours after the onset of acute abdominal symptoms. A fairly large perforation of an ulcer of the anterior aspect of the first part of the duodenum was found. The right kidney pouch contained more than a pint of bile-stained fluid. The appendices epiploicæ of the hepatic flexure and transverse colon and the fat in the gastrocolic omentum showed numerous areas of definite fat necrosis. The operator's finger, passed through the foramen of Winslow, released a quantity of fluid

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gastro-jejunostomy completed the operative treatment, have safely dismissed the patient from hospital in less than two weeks from the date of admission. Pyrexia, tympanites, abdominal pain and other accompaniments of the "drained" abdomen have been conspicuous by their absence.

In a criticism of this nature it is easy for the writers to understand how the suggestion of the Fowler posture and suprapubic drainage became the religion of an army of surgeons. There is something impressive in the picture of the severely inclined patient whose abdominal cavity is filled with a supposedly dangerous exudate leaking steadily to the body surface via a suprapubic tube. Moreover, it was once our religion, until experience and careful consideration showed us its falsity. Surgery is full of hypnotic practices. There are those who maintain that the fluid found upon opening the abdomen in these perforative cases is sterile bacteriologically. With that we cannot agree, but admit that its toxicity is low. If it be sterile, then why, we ask, do these same authorities advocate its drainage?

We believe that the original exudate, composed of visceral content *plus* peritoneal response, is toxic; that once removed and the toxic source eliminated it is followed by a second exudate which is not only sterile bacteriologically, but highly antitoxic as well—an exudate to be conserved for the patient, not drained away, even if that were possible, suprapubically. It is common knowledge that the intestines crowd round the drainage tube, and that the presence of adhesions, wonderfully quickly formed, soon deny the "drain" its power to even leak. Such is Nature's protest, albeit a dangerous one, when the small intestines play a prominent part and adhere to the aperture in the peritoneum through which the tube is inserted and from which it is finally withdrawn.

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tolerate rectal salines, intermittent or continuous, we use a method which we believe is original for such a purpose (*vide* THE PRACTITIONER, April 1928). Let us hope that the day is nigh when a drainage tube traversing any area of a free peritoneal cavity will be as rare as one traversing the synovial cavity of a joint.

We know that the advocates of the Fowler position, when asked how "drainage" of the lower abdomen and pelvis by the suprapubic tube is possible against gravity, reply that intra-abdominal pressure comes into play and produces the phenomenon. We venture to state that this intra-abdominal pressure element is grossly misunderstood and exaggerated in importance in this, as in the numerous conditions for which it is held responsible. We are even told that the normal position of the uterus, anteversion, is produced and maintained by intra-abdominal pressure. The authors recently made inquiry of a well-known British physiologist and received the reply: "I regret to say that I know nothing about intra-abdominal pressure."

pent up in the omental bursa. A complete and dense line of adhesion between the great omentum and the anterior abdominal wall existed and extended from the region of the caput cœci upwards and to the left across the abdomen to the splenic flexure of the colon. These adhesions, so extensive in linear measure, were probably the sequel of the strangulation of a right inguinal hernia, for which the patient stated he had been operated some years before. The peritoneal cavity was thus divided into two parts: (a) an upper, bounded above by the diaphragm and below by the line of adhesions already described; the important peritoneal recesses of this division being the right kidney pouch, the omental bursa, and the recesses between the liver and the diaphragm; (b) a lower, bounded above by the oblique line of adhesions and below by the pelvic cavity; the recesses of this division were part of the right paracolic gutter, the pelvic cavity, the left colic gutter and the various fossæ and folds of the mesentery of the small intestine. All the recesses of the upper division were infected and flooded by bile-stained fluid; the areas of fat necrosis definitely indicated that the peritoneum had suffered severe trauma of a chemical nature. The lower division was completely shut off from the upper and contained no exudate. The case was treated in routine manner, the infected recesses first wiped dry by gauze swabbing, the visceral defect then repaired and the abdominal wound, its layers antisepticized, closed. No drainage was employed. The patient lay flat on his back during his whole convalescence, which was smooth and showed not the slightest rectal rise of temperature.

In this case only the upper "dangerously" absorptive areas of peritoneum bore the brunt of the exudate and chemical trauma. Dry gauze swabbing was employed to cleanse an already damaged peritoneum. Drainage was not even considered. A perfect convalescence resulted.

Our results have been at least as satisfactory as those of other surgeons, and have been obtained by a procedure, already described, which definitely includes mopping of the flooded areas by dry gauze swabs and closure of the abdomen without "drainage." We have long ceased to employ Fowler's posture, and shall never revert to its use.

"Murphy's drip" we use almost invariably, and in such a manner that much fluid is comfortably absorbed while the bedsheets remain dry. In very late cases, especially in advanced septic peritonitis from appendicitis in children who are delirious and will not

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Asthma : its Pathogenesis in Regard to Treatment.

By J. ANDRÉ, M.D.

Mont Dore, France.

THE protean manifestations of asthma have given rise throughout the ages to a succession of theories, each differing from the other in accordance with the current trend of medical thought. Simple pathogenic conceptions, reflecting the findings of ever improving methods in physiological experiment, have generally been based on data furnished by clinical observation, yet many have contained but a modicum of truth. During the last few years there has arisen a new crop of theories, truly impressive in the richness of the possibilities which they unfold. In this article I shall examine the chief of these—those which appear to be more solidly founded—drawing attention to such points of interest as are worthy of fuller consideration, and I shall set forth my personal conception of the disease. My experience extends over some thousands of cases encountered during many years of practice in Mont Dore, a famous treatment centre for asthma.

In order to make an unbiased study of asthma, it is essential to consider in the first place the organism of the patient, and to inquire whether there is not present some modification or alteration in his humoral or physical make-up which may be responsible for the occurrence of the attacks. These attacks must then be analysed and each phase explained. In such a way it is possible to form a general conception of the affection as an entity for which appropriate and efficacious treatment may be prescribed.

It is almost unanimously admitted today that there must be some particular basis or ground for the

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occurrence of asthmatic dyspnoea in a patient: the theory of "essential asthma"—*asthma sine materia*—is no longer tenable. The theory of arthritic asthma was uncontested for a long time, and the arthritic diathesis came to be looked on as an accepted basis of the affection. Little by little, however, the term "arthritic" became so comprehensive, and the pathogenic views multiplied to such a degree, that a clear definition was no longer easy. The various factors had to be regrouped: those of unquestionable arthritic origin being retained and all extraneous elements being discarded; in other words, a sufficiently characteristic conception of this diathesis had to be formulated. A reaction then set in, and, as is usual, went too far, so that for a great number of writers the term "arthritism" simply became an arbitrary label for a conglomeration of unrelated diseases.

Then Charles Richet made his great discovery of anaphylaxis. While studying the toxicity of an extract of the tentacles of actina on the dog, he observed a peculiar phenomenon which led to unexpected deductions. He noticed that if a dog were given any particular dose of poison and were left alone for a few weeks afterwards, it became extraordinarily sensitive to a second dose of the poison, even in minute quantities. Thus the injection of actina poison in a dog sensitized the animal a few weeks later to that poison, with the result that a dose several hundred times less than the normal lethal dose proved fatal. Charles Richet experimented with several poisons and found that the phenomenon remained constant. At this stage, however, the discovery had not the general import it was to acquire later.

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phylaxis—any albumin, it was found, might sensitize the subject. This discovery was immediately brought to bear on the pathogenic conception of asthma. From the very beginning a certain number of observers had noted that foodstuffs and various kinds of dust could, when introduced into the body economy, bring about an asthmatic attack in certain individuals. The patient was thus sensitized to the particular substance; in other words, he became anaphylactic. Systematic research showed that this mechanism was definite. The American school, especially, extended their investigations very widely on the lines of skin reactions in the hope of finding in this way the sensitizing substance present in each case, a method which would have allowed of desensitizing the patient by repeated injections, and so have brought about a cure.

Nevertheless, the multiplicity of these observations revealed that generalizations on this pathogenesis had been too precipitate. Subjects were found who were sensitive to several albumins simultaneously or successively; that is, there was such a thing as polysensitization—anaphylactic specificity did not exist in such cases. Further, it was not always possible to find the sensitizing protein, and in most cases the circumstances of the first introduction of such protein could not be determined. An attempt was then made to substitute a wider conception of anaphylaxis, but here again, as with “arthritis,” by rendering the term too comprehensive, there was a danger of the significance of the phenomenon being misunderstood. Anaphylactic asthma (by that I mean bronchial asthma) is an entity, yet my own statistics show that it occurs in only 4 or 5 per cent. of my cases. The proportion is, on the contrary, much greater with regard to nasal asthma or hay fever, where pollen plays an important part.

Neither arthritis nor this conception of anaphylaxis proved satisfactory. The explanation of anaphylaxis

by the production of toxogenin as put forward by Richet was abandoned. Widal and Abrami, followed by Lumière, therefore formulated two theories which are worthy of permanence. Widal and Abrami looked upon sensitization as a state of unstable equilibrium of the protoplasmic colloids, the breaking down of that equilibrium producing a colloidal shock. They adduced as evidence the phenomena which can be observed and repeated in the blood crisis which precedes, in a general way, the external manifestations of shock. To enter into the details of this theory would be beyond the scope of this article; let it suffice to recall that the premonitory symptoms of a hæmoclastic attack consist of a rise of blood-pressure and an inversion of the leucocytic ratio, with leucopenia.

In the case of anaphylactic sensitization the explanation of this phenomenon was simple. But, as we have seen, in studying these cases more closely it often proved impossible to determine previous or specific sensitization—something else had to be sought for. Widal and Abrami then admitted that acquired sensitization was not necessary for the production of shock. They thought it sufficient if the patient offered a medium in which colloidal shock might take place; this medium they called the colloidoclastic diathesis, an unstable equilibrium of the colloids of the body fluids, liable to be upset by the very smallest influence. If this colloidal diathesis exists, what is it? What is its ætiology? How is it formed? To what is this colloidal instability, this innate or acquired idiosyncrasy, due?

The work of Eppinger and Hess on the sympathetic nervous system, and that of other authors on the endocrine glands, paved the way for a more complete understanding of asthma. The tissue fluids, in which the unstable equilibrium of the colloids brings about the condition of shock, are constantly changed in constitution through the endocrine secretions. Now the

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value of these secretions both quantitatively and qualitatively is in close relationship with the nervous system governing the vegetative processes. I am of the opinion that these influences are reciprocal, and if a certain gland may cause an increase or a decrease in the sympathetic tissues, the vegetative system on its part may occasionally augment or diminish the activity of some other gland.

In the light of these recent results, and in extension of the views on the question which I put forward as early as 1903, I offer a conception of asthma which, while accepting several of the classical data, also takes count of the more modern findings. I hold that asthma occurs in an individual possessing a constitution favourable to asthmatic dyspnoea, this affection being generally the external manifestation of shock conditioned by protoplasm colloids. The constitution which I consider to be the diathesis is formed in an individual through the influence of toxic factors arising from our modern advanced civilized mode of life, and to pursue the ætiological analogy I retain the designation of "arthritic" for this diathesis. Thus this arthritic diathesis may be considered as the result of the sum of toxic factors which, slowly and progressively altering the tissue fluids and rendering the equilibrium of the colloids more and more unstable, prepares the way for the appearance of colloidal shocks. It is obvious that in order to bring about this diathesis the neuro-glandular complex of the vegetative system must play a part.

If the arthritic diathesis is considered as the result of various toxic factors, particularly those of alimentary origin (arising, e.g. from ingested material, from proteopexic deficiencies of the liver, from disturbed metabolism and hyperproduction of uric acid, from cholesterine or other products which may cause upset in a predisposed constitution), and further if any accretion of a heterogeneous substance may, in con-

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junction with the neuro-glandular system, eventually give rise to this diathesis, then, indeed, one may perceive the analogy between the arthritic diathesis as I conceive it and the colloidoclastic diathesis of Widal. Thus the diathetic conception of asthma would always be tenable; the conception having now become up to date and extended to include a constitutional state arising from toxic factors of every description, whether autogenous or exogenous, alimentary or infectious, of protein or mineral source. Such a constitutional state, in a word, which furnishes the nervous conditions requisite for the occurrence of asthmatic attacks.

I am therefore now in a position to define asthma, and in doing so I take into account predisposing factors and clinical findings, and at the same time stress a point of great assistance in diagnosing the condition, a phenomenon so remarkably constant as to be almost pathognomonic. I refer to the eosinophilia of the blood and of the sputum (F. Bezançon). I define asthma, therefore, as a paroxysmal expiratory dyspnoea, with or without vasomotor and vasosecretory phenomena, and generally accompanied by eosinophilia in the sputum and the blood. It occurs in subjects of arthritic diathesis and is characterized generally by intervals of apparent health.

To obtain a more complete knowledge of asthma it is necessary to examine the factors which determine and constitute the crisis in an arthritic individual subject to asthma. What is the condition through which the diathesis is crystallized into respiratory dyspnoea? Since 1903 I have laid stress on the importance of the conception of the asthmogenic irritation, a point which has been studied by numerous authors. As paroxysmal dyspnoea is usually the external manifestation of tissue clasis, two factors are necessary to produce asthma: (1) shock must be possible, and (2) its manifestations must be respiratory. One mechan-

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endocrine hyperactivity, muco-membranous diarrhoea of the colon and intestine, and many other more or less vaguely defined symptoms. And this conception, I maintain, the practitioner can regard as the basis of therapeutic indications, of adjuvant therapy, of altering and transforming the constitutional diathesis. Treatment may be carried out by regulating the various factors, by promoting elimination by adequate measures and removing—although not too heroically—the painful symptoms of the disease. Such palliative and indeed often curative measures are in fact frequently those which Nature herself suggests, in order to permit the patient to live happily and, it may be, to a good old age, although he may be encumbered (through no fault of his own) with a legacy of an arthritic diathesis handed on by his forbears.

Every paroxysmal crisis is, therefore, simply a defensive mechanism for the expulsion of harmful substances. The asthmatic attack is Nature's method of preserving intact the body economy, and I attribute to these evacuant attacks, in many cases, the remarkable efficacy of the treatment at Mont Dore, where such crises are frequently provoked, with the result that the patient begins to improve and progresses frequently towards a complete cure. Of course, it is essential to mitigate the asthmatic paroxysms, although they may be necessary; but they must not be suppressed too drastically. The first consideration is to treat the constitution which allows them to occur. A rational regimen of diet and hygiene must control the alimentary intake and assist in the elimination of toxic products. The vitality of the organism must be improved and the low condition of the body fluids raised; this can be done by medicinal treatment, hydro-mineral therapy, and endocrine medication—in a word, the arthritic constitution must be improved before its active manifestations can be successfully treated.

ism and one only can bring about these two results when the diathesis is present—namely, respiratory irritation. A sclerosed focus in the bronchi or lungs, a cicatrix resulting from some previous affection which has cleared up, causes irritation by compression of or association with a termination of the pneumogastric nerve. This irritation sets up a general hyperexcitation of the vagus, and so brings about conditions favourable to shock. Further, the external manifestation becomes reflexly concentrated on the originating point of excitation on the respiratory tubes. Here then is an explanation of the vagotonic factor in asthma.

The asthmatic attack itself consists of two principal elements which must clearly be recognized: a spasmodic element, that is, the contractions of the bronchial and inspiratory muscles, partly due to the vagus; and a secretory and vasomotor element, controlled by the sympathetic.

The asthmatic attack contemplated as a whole appears to me to be an evacuant crisis of the toxic elements which are present in excess in the organism. For some reason or other—excess, overwork and so forth—an arthritic subject sustains an overproduction of toxic substances from ingesta or malassimilation which exceeds the possibilities of elimination through the natural emunctories of the body. The result is that a toxic overcharge takes place and the instability inherent in the humoral diathesis increases. The slightest excitement at this point can upset the precarious equilibrium of the tissue fluids and an asthmatic attack occurs.

This conception of the arthritic diathesis is primarily a diathesis of endogenous or exogenous intoxication, in which the organism tends to free itself of excess toxic products by means of evacuant crises, such as asthmatic attacks, vasomotor rhinitis, hæmorrhoidal oozing, eczema, urticarial outbreaks, hepatic evacuant crises,

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on, if these agree, once or twice a week, half to one oz. of the inside portions of lamb or breast of chicken, hot—never cold or twice cooked. Raw white of egg, as albumin water, does not cause acidæmia; it does so, however, when it has been cooked, especially as the solid white of egg. It acts, like cooked meat, as a veritable poison to some children. The same applies to animal fats (butter, lard, etc.).

Development in assimilative powers for protein foods is much advanced in the sexually precocious child, and this type can easily be discerned in children of very tender ages. The converse obtains in the hypogonads.

The symptoms of acidæmia are well marked. The prodromal symptoms are usually increased appetite followed by loss of desire to eat, then malaise, headache, vomiting, and, finally, unconsciousness and death. The vomiting is one of Nature's remedies, for, by throwing out of the system, from the only place where large amounts of acids are secreted and tolerated, it stops a further depletion of the body alkalis, and allows the stabilization of the alkaline blood content to take place, by its absorption of CO_2 from the tissues, to form the various carbonates. The breath becomes foul with the smell of acetone, likened to decaying apples. If the urine is tested in the early stages, it will be found to be acid throughout the twenty-four hours, i.e. there is an absence of the normal alkaline tide after food. At first there is no acetone nor diacetic acid. Later on, however, and before the vomiting, acetone occurs in the urine, to be followed later by the presence of diacetic acid. As improvement takes place it is preceded by a diminution of the diacetic acid and acetone, and the child is apparently well before all traces of acetone disappear in the urine, which then becomes alkaline if the correct treatment has been instituted. After the age of eight the dis-

Notes on Acute Acidæmia in Childhood.

By JULES REY, M.R.C.S., L.R.C.P.

Honorary Physician, Bognor War Memorial Hospital.

IT must be realized that acute acidæmia is a condition purely of chemistry, and due to a depletion of the alkaline contents of the body. The attacks are due to faulty feeding, for children vary greatly in their development in assimilating various kinds of foods. Thus, at birth till eight months they are capable of digesting, completely, human milk. Artificial foods are good, but great care must be exercised in their choice, and many varieties may have to be tried to find a suitable one. All milk used in their preparation should be pasteurized. Some babies have advanced development for carbohydrates, even before the age of two months; for them one of the babies' foods containing a little starch is indicated.

Acidæmia is a rarity in breast-fed babies. When the food has to be altered at the age of eight or nine months by supplying carbohydrates, it is a great mistake to add any form of protein of a cooked nature, or meat extracts. The milk and carbohydrate diet should be continued till the child is two or three years of age; up to this time only pasteurized milk (protein-containing) and raw albumin water may be added to the diet. When two or three years have been reached, albuminoid food should carefully be added in small amounts and the child watched for any symptoms of acidæmia. At first add a lightly boiled egg, "coddled" (white in fluid state), then meat gravy and steamed fish. Later

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ability of acidæmia tends to disappear entirely.

TREATMENT.

That prevention is better than cure aptly applies to this condition. Diet is the all-important material to prevent it, or a recurrence. As soon as an attack occurs, alkalis must be given in large amounts until the urine becomes alkaline. The best variety in mild cases is potassium citrate in lemon or orange syrup; half-drachm doses of potassium citrate are given every hour. In severe cases sodium or potassium citrate must be injected into the rectum and retained. Graver cases should have injected a few units of insulin, the amount varying according to the age and severity of the case and its ingravescient condition. After an attack, the urine should be examined frequently, and a few tablets of sodium citrate, about 30 to 60 grains, given daily for some months. At the earliest sign of any symptoms the potassium or sodium citrate should be considerably increased until the urine becomes alkaline, when it can be relaxed.

Alkalæmia is the opposite of acidæmia, and is very rare in children; it requires diluted hydrochloric acid in large amounts to overcome this condition. Confusion arises from the fact that the urine, like that of acidæmia, is positive to Legal's and Rothera's tests; it is, however, strongly alkaline.

DIETS FOR ACIDÆMIC CHILDREN.

Age : Birth to 8-9 months.—Breast-feeding is most desirable. If impossible, give artificial foods poor in fats. All milk should be pasteurized. Albumin water sweetened with lactose—no lemon-juice. Plenty of plain water. A few drops of raw cabbage juice daily. Orange juice, grape juice, a little mashed banana. Sodium citrate tablets according to age and condition. Ultra-violet rays, or every month 2 c.cm. irradiated

ACIDÆMIA IN CHILDHOOD

(tungsten arc) auto-hæmo-serum therapy.

Age : 8 months to 1-2 years.—Commence adding foods gradually. Infant foods containing a little starch (some children do not develop the power of assimilating starchy foods till fully one year old). Skimmed milk, or milk poor in fats, water biscuits (such as Robb's), fine gruel, blancmange, arrowroot, custard (made with custard powder, *not* egg), rusks, finely-ground wholemeal bread, cooked soft vegetables, jams, honey, sugar, cooked fruit, milk puddings, raw tender lettuce, raw cabbage juice, grapes, oranges, bananas. Sodium or potassium citrate as required. (N.B.—No raw apples.) It is essential that up to two years of age no eggs, cooked meat, or meat extracts be given. Raw meat juice may be given for anæmia, but the risk of infection from this almost prohibits its use. Tubercle and various kinds of ova of tapeworms abound in the flesh of cattle. It is better to overcome this by a course of albuminoid arsenic injections. Ultra-violet rays as for above if necessary.

Age : 2 years onwards.—The same dietary as for 8 months to 2 years, only the amount is increased. Skimmed milk is preferable to whole milk. Proceed carefully to add a little fat to the diet, and confine this to vegetable fats, such as nut margarine, not ordinary animal fat butter. Try, not more than once a week, a "coddled" egg. (Place the egg in sufficient boiling water to cover it. Put it in this condition in a cool place for five to seven minutes, according to the size of the egg; it will be found then that the white is curdled and not "set.") If there are no symptoms of acidæmia a little fish may be added to the diet, and subsequently a little tender chicken or lamb once a week, but beware of the proteins and fats.

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Practical Notes.

The Treatment of Chronic Bright's Disease.

J. Salisbury Craig observes that opinion in this country is at present divided as to the efficacy of decapsulation in the treatment of intractable cases of chronic Bright's disease. He records the case of a woman, aged 36, who suffered from chronic Bright's disease in an advanced degree; she had very marked anasarca, ascites, œdema of the lungs, and the urine contained albumen to the extent of 40 parts Esbach. In spite of eliminative treatment and dieting there was no appreciable improvement after some months, and it was decided that the good condition of the vascular system and the absence of retinal changes warranted surgical treatment. Decapsulation of the right kidney was performed and, after an interval of six weeks (owing to the occurrence of bronchitis), also of the left kidney. After the second operation the patient's condition gradually improved; she left hospital in a month, and when seen two years after the operation she was enjoying good health.—(*Glasgow Medical Journal*, July, 1928, p. 40.)

The Treatment of Rickets.

A. Delille and M. Bertrand have come to the conclusion that in the treatment of rickets the administration of vitamin-D is quite as effective as treatment by sunlight therapy or ultra-violet rays; X-ray examinations of their patients suffering from rickets have shown rapid improvement in the condition of the bones after the institution of treatment with irradiated ergosterol (*ergostérine*), and at the end of two months there was a veritable transformation in the condition of the rickety children.—(*Gazette des Hôpitaux*, July 21, 1928, p. 1050.)

Intestinal Influenza.

F. H. Boone draws attention to a term which has been applied since 1918 by laity and medical practitioners alike to certain types of cases with abdominal symptoms. Influenza was epidemic in various parts of the world in 1918-1919, and since then it has been endemic in the colder seasons; during this period of the year the cases occur that have been classified as "intestinal influenza." This condition has been more frequently observed in the very young than in the adult. In many instances there has been no obvious involvement of the respiratory tract, and diagnosis has been based on the association with epidemics of influenza and suggested by the generalized muscular pains. Dr. Boone emphasizes the diagnostic difficulties presented by these cases, for numerous other etiological agents may give rise to similar disease-complexes, among them bacillary dysentery, frozen milk, and parental infections of all

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The Influence of Nasal Sepsis on the Lungs and Gastro-Intestinal Tract.

E. D. D. Davis insists that the nose requires a careful examination in all inflammatory conditions of the lower respiratory and intestinal tracts, and that the reverse is equally important in that the respiratory and gastro-intestinal systems should be investigated in all cases of chronic nasal suppuration. The lungs can be infected by direct extension of the inflammation of the nose, and an existing lesion of the lungs is aggravated by nasal sepsis. Chronic nasal sinus suppuration should be regarded as a potential chest case, and general treatment similar to that of tuberculosis should be carried out, in addition to the local treatment of the nose.—(*Journal of Laryngology and Otology*, July, 1928, p. 465.)

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The Treatment of Facial Nerve Paralysis.

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H. Lowenburg observes that there is no drug, serum, antibody solution, intravenous remedy or other remedy that will prevent, abort or shorten the duration of pneumonia, either of the lobar or the bronchial type. Lobar pneumonia always has been a self-limited disease which, in children, presents an exceptionally low mortality; consequently it is extremely difficult, if not impossible, properly to evaluate any therapeutic procedure in its relationship to prevention or to cure. Rest, flat belly, fresh air are a working combination which yields the best results. A four-hourly interval in which to handle the patient should be adopted unless the patient requests more attention. Tympanites is an extremely dangerous symptom; the bowels should be emptied daily, preferably by enema; the following prescription is valuable in stubborn cases:

R	Ext. cascara sagrada	mxx
	Tr. belladonna
	Tr. nucis vomicae
	Glycerine	5j
	Milk of asafœtida	5j

Strong children with lobar pneumonia bear cold, fresh air well, provided their bodies are warm and their peripheral circulation is maintained. In lobar pneumonia temperatures of 105° to 107° are common and are not dangerous *per se*; a child should not be disturbed for a bath if its general appearance is good; sponging is bad. As regards food, it is inadvisable to push milk to the exclusion of other food; 4 to 6 ounces of glucose, scattered throughout the food daily, may be routinely employed to great advantage. Cereals, fluids, and fruit juices combat acidosis and toxæmia. No drug merits routine employment, with the exception perhaps of sodium citrate in rather large doses, 10 to 15 grains every four hours.—(*Medical Journal and Record* [New York], August 1, 1928, p. 126.)

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of an hour, pulseless, cyanotic, with inactive pupils, and hardly perceptible breathing; 1 gram of sodium thiosulphate was injected intravenously. After a couple of minutes normal breathing was restored, the pulse reappeared, and consciousness returned. Half an hour later the patient was able to return home, and two days afterwards was reported to be in perfect health. So rapid a result, Dr. Feyerabend thinks, can only be explained by a chemical reaction which is proportional to the amount of thiosulphate given. For this reason, the small amounts—from 0.1 to 0.2 gram—recommended in the textbooks are quite useless, it being necessary to give at least 1 gram to ensure satisfactory results.—(*Klinische Wochenschrift*, July 8, 1928, p. 1351.)

The Treatment of Urethral Diverticula.

T. B. Monat observes that the treatment of urethral diverticula necessarily varies, but where it is possible an attempt should be made to dissect out the wall of the sac, after it has been opened and emptied of its contents, while the aperture of communication with the urethra is closed by suturing lateral flaps, which have been dissected up at the neck of the sac, over a gum-elastic catheter passed along the urethra and left tied into the bladder. This ideal method of treatment is generally possible—in the absence of any acute infection—in all varieties of diverticula of the anterior urethra, and also in the congenital prostatic pouch; whereas the most that can be done in the acquired forms of prostatic diverticula is to cut down and evacuate their contents by a median perineal section; after this method of treatment, however, the stones are liable to re-form.—(*British Journal of Surgery*, July, 1928, p. 51.)

The Treatment of Chorea.

W. Glaser has treated cases of severe chorea by inducing passive congestion of the head, and claims good results from this method. A broad indiarubber band of loose texture which can be tightened and loosened as desired is placed round the child's neck, the larynx and bony points being protected by soft padding. The band is adjusted until the face becomes faintly cyanosed and slightly oedematous. Any pain is due to excessive pressure and is an indication for loosening the band. Many children will tear the band off at first, either by voluntary effort or by the force of their involuntary movements; but any necessary restraint should be dispensed with as soon as possible. The band should be left on for ten hours and then removed for two hours, during which time the neck should be rubbed with spirit to prevent any harmful pressure effects. The band is replaced for a further ten hours, but a third application is not often necessary. The more violent movements cease during the first ten hours, and the child becomes much quieter. He considers that the success of the method is dependent on the effect of congestion on the carbon dioxide balance between the tissues and the blood.—(*Münchener Medizinische Wochenschrift*, July 27, 1928, p. 1288.)

Reviews of Books.

The Extra Pharmacopœia of Martindale and Westcott. Revised by W. HARRISON MARTINDALE, Ph.D., etc. Nineteenth edition. Vol. I, pp. xxxvi+1,207. London: H. K. Lewis & Co., Ltd. 27s. 6d. net.

It is just four years since the appearance of the last edition of this indispensable vade-mecum. This would seem to be a very short period to elapse between the two editions of such an important work involving, as it does, the searching scrutiny of vast stores of accumulated results of surgical and medical as well as chemical research. It would take too much space to mention only the new preparations of which particulars are given, and to give the barest outline of all the novelties in medical treatment is an impossibility. So we must be content to say that our examination proves that what we expected is fulfilled, namely, that nothing of value has been overlooked. As an example we may refer to the good account given of the treatment of pernicious anæmia with liver preparations in which details are recorded of desiccated liver, its concentrated extract, a scheme for a liver dictary, the preparations of commerce, the dosage, and results obtained by different observers. The almost overwhelming mass of vitamin literature is concisely summarized in the chapter on "Nutrimenta"; this chapter is exceedingly useful and thorough, without being prolix. The volume is in every way a fine memorial to the two men whose names Dr. Martindale has incorporated, permanently we suppose, in its title. In this we recognize an expression of filial feeling and a tribute to his father's friend and his own friend and late collaborator. The value of the extra pharmacopœia is greater than ever—if that be possible.

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THE third edition of this well-known manual embodies many alterations and additions, including an exposition of the kinetic theory of gases. Now that physiology and pathology are so largely "biochemical" and "biophysical," it is essential that the medical student should have a good grounding in chemistry and physics, and this book should serve for the last-named. The bearing of physics upon the special problems of medicine is always borne in mind and we thus find, for instance, that under the heading of "Light" the construction of the laryngoscope, ophthalmoscope, and microscope are dealt with; under "Heat" the opportunity is taken to say something about winds and climates; mention is also made of the action of ultra-violet light, of Finsen treatment, and of therapeutic "lamps," and X-ray tubes and rays are described. At the end of every chapter a few numerical exercises, with the answers,

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of an hour, pulseless, cyanotic, with inactive pupils, and hardly perceptible breathing; 1 gram of sodium thiosulphate was injected intravenously. After a couple of minutes normal breathing was restored, the pulse reappeared, and consciousness returned. Half an hour later the patient was able to return home, and two days afterwards was reported to be in perfect health. So rapid a result, Dr. Foyerabend thinks, can only be explained by a chemical reaction which is proportional to the amount of thiosulphate given. For this reason, the small amounts—from 0.1 to 0.2 gram—recommended in the textbooks are quite useless, it being necessary to give at least 1 gram to ensure satisfactory results.—(*Klinische Wochenschrift*, July 8, 1928, p. 1351.)

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THE PRACTITIONER

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Recent Advances in Surgery. By W. HENEAGE OGILVIE, M.A., M.D., M.Ch., F.R.C.S. Pp. 461. London: J. & A. Churchill. 15s. net.

THE author has apparently two ends in view—to present an epitome of recent surgical literature and modern practice, and also to criticize and explain. Two tendencies are thus evident in each of the sixteen sections, but in varying degree. The sections dealing with cancer, plastic surgery, venereal disease and the chest, are written respectively by Messrs. Carter Braine, Kilner, Lloyd and Grant Massie. Necessarily where one man sets out the work of many specialists he must take much on trust, but we think that the book would have benefited had some of the matter included as recent advance been suppressed in favour of more extended criticism of present-day progress and practice. We think it superfluous also to include descriptions of the universal inguinal operation for femoral hernia and of local analgesia for inguinal hernia, together with illustrations of syringes. In neuro-surgery the author includes much that is properly found in textbooks, such as the symptomatology of pituitary tumours, and although a page is given to diagrams of visual fields in nerve, chiasma and tract lesions, no mention is made of Traquair's work in perimetry that bears on this subject. Neither in this nor in the urinary section is there an account of Barrington's researches on the nervous mechanism of micturition. The thyroid section advocates iodine therapy with little reservation or indication of the disappointments it provides in simple and toxic goitres. Subjects are introduced by accounts of pathological and experimental work, contain practical descriptions of treatment and results, and have appended bibliographies. The book is thus at once an interesting volume to read and a work of reference that should prove equally useful to surgeons and to general practitioners wishing to know what may be expected from the application of modern surgical methods.

The Examination of the Central Nervous System. By DONALD CORE, M.D., F.R.C.P. Pp. 248. Edinburgh: E. & S. Livingstone. 4s. 6d. net.

THIS little book is intended for the use of medical students, particularly those who have not completed their training in neurology. Its scope is accordingly somewhat limited, but should be adequate for the purpose. The motor system is first considered, attention being given to the various types of tremor, co-ordination of movement, gait, muscle tone, and the reflexes. The sensory system is next described, and then follows an outline of the distribution and functions of the cranial nerves. Chapters on mental states, routine of examination, cerebro-spinal fluid and diagnosis complete a book which is a useful synopsis as a preliminary to more advanced study.

Preparations, Inventions, Etc.

THE CURTIS APPLIANCES.

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THE PRACTITIONER

a great convenience to patients and practitioners alike if the constant hypodermic injection of insulin could be effectively replaced by the oral administration of such a preparation as this. We therefore welcome its appearance in the market and hope that practitioners will give it a thorough trial in the treatment of diabetes.

CALMITOL.

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Calmitol consists of an ether-alcoholic solution of camphor aldehyde, slightly iodized, with the addition of menthol and a trace of hyoscine oleate. We find that this preparation affords rapid relief from the itching attendant upon many skin affections. In addition, it is a powerful germicide and penetrates deeply into the skin so that it reaches subcutaneous sources of infection. In the treatment of eczema, pruritus, insect bites, etc., calmitol should be dabbed—not rubbed—on the affected part with a piece of cotton wool, or calmitol ointment may be applied instead of the lotion.

A NEW FORCEPS GRIP.

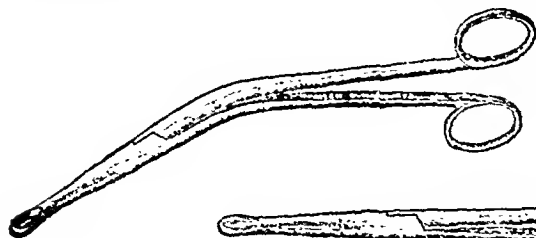
(London : Messrs. Allen & Hanburys, Ltd., 48, Wigmore Street, W.1.)

Mr. Denis Browne, F.R.C.S., Resident Medical Superintendent, the Hospital for Sick Children, Great Ormond Street, London, writes as follows :

Some years ago when working out an instrument for holding that very friable organ, the tonsil, during dissection, I designed a grip which I believe to be both new and of a fairly wide application in surgery. Its principle is to produce a ruck in the material grasped by its blunt overlapping jaws (A) much in the way of the Army Regulation Fastener for webbing straps. It is obvious that a grip of this sort will tear out less easily in flimsy material than one that depends for its hold on piercing or crushing. The original tonsil forceps (B) proved so popular that I have had two other models made : a tissue forceps (C), which is very useful



A



B



C

for holding tuberculous glands, cyst walls, and other "washy" tissues, and a bowel forceps, which I think will grip intestine more firmly and with less damage than anything else I have ever tried.

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NOVEMBER

1928

Workmen's Compensation.

By SIR JOHN COLLIE, C.M.G., M.D., J.P.

Medical Examiner to the London County Council; Chief Medical Officer, Metropolitan Water Board; Consulting Physician to the Ministry of Pensions, etc.

WHEN a practitioner, acting on behalf of an employer, reports that in his opinion a workman has either fully or partially recovered from an accident or an industrial disease, the procedure is that the employer must serve a notice on the workman, intimating that he is advised that the workman is now fit for work, or partially so, as the case may be, and informing him of his intention of ceasing or diminishing the weekly amount which he has been paying under the Workmen's Compensation Acts. Along with this notice he has to send a copy of his practitioner's certificate. What generally happens is that the workman takes a copy of this medical certificate, which his master must, by law, send to him, to the practitioner who has been attending to him, and who has weekly been supplying certificates of unfitness. Forgetful that it is not his mistakes but his subsequent conduct which condemns him, he generally supplies a certificate to the effect that the workman has neither recovered nor partially so. Then

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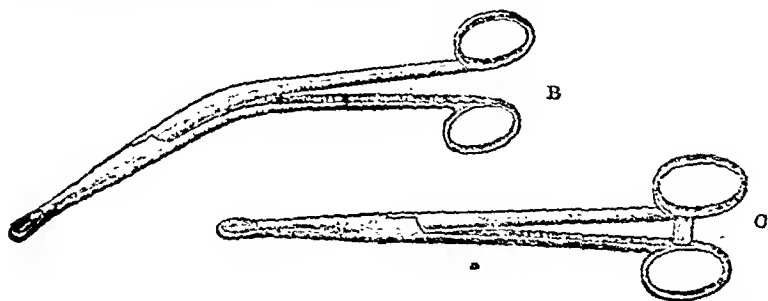
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WORKMEN'S COMPENSATION

Both the employer and the practitioner are largely dependent on the man's statement, and often all that can be said is that the condition found is compatible with the workman's statement, which often—sometimes too often—means that the master has to shoulder the responsibility. Much, of course, depends upon whether the alleged accident was reported at the time, and whether it was mentioned to fellow-workmen if not reported. I am always sceptical about a hernia said to be due to duty if no complaint was made for days after an alleged accident, for all workmen know, in view of a possible claim under the Workmen's Compensation Act, the necessity of reporting an accident at once. On the other hand, I have seen many genuine cases where apparently the workman, whilst engaged in some unusually strenuous work, feels slight pain in the groin at the time, but takes little or no notice of it, and finds within a few days that a comparatively painless hernia has developed.

When all is said and done, however, hernia cases frequently remind me of the schoolboy's definition of a lie. "It is," he said, "an abomination in the sight of the Lord, but a very present help in time of trouble." The clinical personal history of the happenings connected with the occurrence of a hernia are often not those of a seeker after truth, but of one who, consciously or unconsciously, displays a remarkable facility of re-arranging his prejudices.

The boggy of so-called "light work" is a bugbear. I frequently have certificates sent to me from practitioners recommending "light work." These are intended to be of the nature of a compromise between full work and no work. I am often able, in the cases of men employed in either of the public bodies which I serve, to arrange for it—when it is really necessary. I am bound, however, to do so sparingly, for there is in fact very little light work to be found. Many of the

THE PRACTITIONER

the question in dispute may, by a recent provision in the Workmen's Compensation Acts, be referred to a medical referee.

The certificate from the employer's practitioner, stating that the employee is fit to work, and that of his own practitioner, if it states he is unfit, have to be sent to the medical referee. The fuller and the more detailed the employer's medical certificate is, the greater are the facilities afforded for contradiction and expansion by the workman's practitioner, who, be it observed, has the last word. The employer's medical certificate should, therefore, be short and indicate only the principal grounds for the certificate. The employer's practitioner will probably have had opportunities in previous certificates of giving to the employer a full statement of the reasons for his conclusions, but these should not appear in the final certificate.

The following is an example of a report to a medical referee :—

I have examined . . . and find him to be wholly (or partially) recovered from the effects of the accident sustained by him on the . . . day of . . . 192 .

The grounds of my opinion are as follows :

1. The fracture has firmly united.
2. The function of the limb is restored.

Signed..... Date.....

These workmen's compensation cases are often very difficult to deal with; for instance, a large number of working men suffer from hernia, and many of these are the result of strains during work. They are very troublesome, from the point of liability of the employer. If I were an employer of labour, I would have every case of alleged hernia medically examined within a few hours. Whatever the cause, the temptation to allege work as the cause is very great. An accurate history of the origin is more satisfactorily obtained if the workman is seen and medically examined before a workshop discussion of the case and its possibilities takes place.

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recommendations submitted cannot be acceded to, because the men are really fit for work, but many of the cases are met by the suggestion that the workman might be allowed "to go easy for a few days." In the case of injured workmen for whom insurance companies are paying, "light work" is very frequently advised by the man's practitioner, but employers naturally expect that the company in which they are insured will pay half wages until the employee can do his *full* share of work. The result, therefore, of the recommendation of light work, although meant kindly, is almost invariably refused, and the workman is out of work often for months quite unnecessarily, often entailing great privation to the family. The truest kindness is to postpone the return to work for a week or two, and then firmly to refuse any modified certificates. I find that sometimes employers, even when insured, will sympathize with a recommendation to the effect that a man be allowed "to go easy at first," when they will not listen to any suggestion of light work. Working men are sympathetic with their own class, and do, I believe, make allowances for a short time to those who have been incapacitated.

Workmen's Compensation Acts affect, very materially, the relationship between an injured workman and the medical practitioner who is called upon to report on his fitness or otherwise for work. There have been various Acts, commencing in 1897 and ending in the latest in 1923. The trend throughout in the various new Acts has been to utilize more and more the services of medical referees. The Acts were somewhat confusing, and the whole of them have been consolidated into the Workmen's Compensation Act of 1925. It may be useful to set out shortly and categorically the provisions of the Act as far as medical referees are concerned. They are as follows:—

- (1) There is a right of appeal to a medical referee

WORKMEN'S COMPENSATION

by the workman or his employer against the certificate of a certifying surgeon in regard to industrial diseases.

- (2) The judge or arbitrator has power to summon a medical referee to sit with him as assessor at the arbitration proceedings.
- (3) The workman or the employer has a right to apply for the medical assessor to be summoned at the trial. Formerly, both the workman and the employer had to agree to this, but it has now been very wisely altered.
- (4) The judge or arbitrator may refer to the medical referee, while proceedings are pending, any questions which may be material to the arbitration.
- (5) When either of the parties cannot come to an agreement as to whether a workman is or is not fit for work, either of the parties may refer the question of a workman's condition to the medical referee.
- (6) The registrar or judge may obtain a report directly from the medical referee, when information as to the workman's condition is inefficient or conflicting, in those cases which come before them where an agreement is sought to be recorded in connection with a lump sum settlement.
- (7) Prior to 1923 an employer could end or diminish weekly payments at his discretion (subject of course to the workman's right to arbitration), but under the Act of 1923, if the employer is of opinion that a workman is no longer unable to work he must serve on the workman a copy of the employer's practitioner's certificate within six days of the medical examination, together with a notice of the employer's intention at the end of ten

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recommendations submitted cannot be acceded to, because the men are really fit for work, but many of the cases are met by the suggestion that the workman might be allowed "to go easy for a few days." In the case of injured workmen for whom insurance companies are paying, "light work" is very frequently advised by the man's practitioner, but employers naturally expect that the company in which they are insured will pay half wages until the employee can do his *full* share of work. The result, therefore, of the recommendation of light work, although meant kindly, is almost invariably refused, and the workman is out of work often for months quite unnecessarily, often entailing great privation to the family. The truest kindness is to postpone the return to work for a week or two, and then firmly to refuse any modified certificates. I find that sometimes employers, even when insured, will sympathize with a recommendation to the effect that a man be allowed "to go easy at first," when they will not listen to any suggestion of light work. Working men are sympathetic with their own class, and do, I believe, make allowances for a short time to those who have been incapacitated.

Workmen's Compensation Acts affect, very materially, the relationship between an injured workman and the medical practitioner who is called upon to report on his fitness or otherwise for work. There have been various Acts, commencing in 1897 and ending in the latest in 1923. The trend throughout in the various new Acts has been to utilize more and more the services of medical referees. The Acts were somewhat confusing, and the whole of them have been consolidated into the Workmen's Compensation Act of 1925. It may be useful to set out shortly and categorically the provisions of the Act as far as medical referees are concerned. They are as follows:—

- (1) There is a right of appeal to a medical referee

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by the workman or his employer against the certificate of a certifying surgeon in regard to industrial diseases.

- (2) The judge or arbitrator has power to summon a medical referee to sit with him as assessor at the arbitration proceedings.
- (3) The workman or the employer has a right to apply for the medical assessor to be summoned at the trial. Formerly, both the workman and the employer had to agree to this, but it has now been very wisely altered.
- (4) The judge or arbitrator may refer to the medical referee, while proceedings are pending, any questions which may be material to the arbitration.
- (5) When either of the parties cannot come to an agreement as to whether a workman is or is not fit for work, either of the parties may refer the question of a workman's condition to the medical referee.
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by the usual arbitration proceedings in court. If the case goes before the court, it may decide that the employee has not recovered, or that, in fact, he had recovered on the date of the employer's medical man's certificate.

The point is, that if the case goes before the medical referee instead of the court, and the medical referee finds that the man had, in fact, recovered at the date of the employer's medical man's certificate, he cannot, by law, antedate the certificate to correspond with that of the employer's medical man, and can only report that he was well on the date of his examination.

If, as it is open to him to do, the workman in the meantime commences arbitration proceedings (for compensation for the period between the expiry of the date of the notice he has received from his employer and the date of an adverse report by the medical referee), the additional burden of costs is placed on the employer, whose only alternative is to contest the proceedings and bring medical evidence before the court to justify the cessation of weekly payments, in accordance with his practitioner's certificate. The expense of so doing would be greater than the cost of settlement; the result is that the workman invariably benefits by receiving compensation in respect of a period between the date when the employer's practitioner has reported him as fit for work, and the receipt of the medical referee's certificate to the same effect.

The difficulty would be met by extending the power of the medical referee to deal in his report with the period between the date of the employer's practitioner's certificate and his own examination, and no doubt in time the law in relation to this will be altered.

days to end or diminish the weekly payment. If, however, the workman furnishes to the employer a counter medical report disagreeing with the certificate of the employer's doctor, the weekly payment cannot be ended or diminished except by a certificate given by a medical referee to whom the matter may be referred. Unfortunately, to obtain a medical referee's certificate on a reference usually takes three or four weeks.

- (8) Cases where workmen are leaving the United Kingdom may be referred to the medical referee.

Where a workman has been given ten days' notice to end the weekly payment, and the matter is subsequently referred to a medical referee, his certificate as to the condition and fitness for work *dates from the date of the examination* of the workman and cannot take effect retrospectively. There is no provision, when the certificate of the medical referee is in favour of the employer and the weekly payment has been ended on a ten days' notice, to dispose of the period between the date when the weekly payment was stopped and the date of the medical referee's certificate. This difficulty arises in every case where the medical referee confirms the certificate of the employer's practitioner, and to save the expense of further proceedings the employer has invariably to continue the weekly payment to the date of the medical referee's certificate, involving very often a payment of from £5 to £10. In other words, when an employer stops payment on the advice of his own practitioner, and the employee claims that he is still unfit for work, one of three things must happen. Either the employer accepts the statement of the employee's practitioner and continues to pay, or he does not accept it, in which case the matter may be referred either to the medical referee or may be tried

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It seems to us a most extraordinary feature of everyday life that people submit themselves to treatment and to surgical procedure without really taking anything but an apathetic interest in the diagnosis and treatment of their cases. The following instances actually came under our notice recently:—

Case 1.—We were asked to see a lady suffering from abdominal pain; she had a median abdominal incision, and marked tenderness in the right iliac fossa. Our diagnosis would have been chronic appendicitis, but we were informed that her appendix had been removed some years previously. In the course of examination later, an opaque meal revealed a large kinked appendix, which was removed. It was subsequently discovered that the earlier operation had been performed for removal of the right ovary, together with the right Fallopian tube.

Case 2.—We recently saw a lady with a scar 11 ins. long extending from the epigastrium to the symphysis pubis. She was quite unable to give us any information whatsoever as to the operation which she had undergone; all we could extract from her was that she "thought she had gall-stones." We found out from the surgeon who had operated that a partial gastrectomy had been performed, and that the gall-bladder had been left severely alone.

Case 3.—A further instance was that of a lady with a large scar in the right lumbar region. Why she was operated on she did not know, but it had been done in India by a surgeon whose name she had forgotten and who, she thought, was now out of practice, or possibly dead.

Medical instances are too numerous to relate, as, for example, the patient who tells the doctor that he has had vaccines, but for what he does not know! It is all very difficult and irregular, but could so easily be rectified if, in the first place, the physician or surgeon would definitely explain his illness to the patient; and, secondly, if the patient would insist upon having some record of his illness—a record to which he surely has a right. We would therefore suggest, with great temerity, that a written report or statement might be given to a patient after any more or less serious illness or operation, which report could easily and readily

The Medical and Surgical Dossier or Patient's Case-Sheet.

By SIR MAURICE ABBOT-ANDERSON, C.V.O., M.B., B.S., *etc.*
Honorary Physician to H.R.H. Princess Royal and Household ;
Knight of Grace, Order of the Hospital of St. John of Jerusalem ;

AND

E. P. SCOTT, M.B., B.S., M.R.C.S., L.R.C.P.
Late Emergency Officer, Receiving Room Officer and House Surgeon,
London Hospital.

EVERY medical practitioner must often have experienced the difficulty of obtaining from patients an accurate history of their previous illnesses. This state of affairs is no doubt largely due to the fact that the physician or surgeon in charge of a case does not enlighten the patient sufficiently as to the trouble from which he is suffering. This information can quite easily be given, and in such a way that it can readily be understood by the average lay intelligence. If this were done, the general public would become still more emancipated, the patient would be saved considerable expense, and the physician a vast amount of time, to say nothing of the increased accuracy that would be achieved in diagnosis.

We have forcibly been struck by the ignorance which prevails amongst all classes of patients concerning their previous illnesses, and also in respect of the details of the treatment they have received, including the nature of operative measures that have been performed. Another important factor which has led us to ventilate our views on this subject through the medium of THE PRACTITIONER is the delay frequently caused by

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be produced in case of future need.

While discussing this subject, would it not be an excellent thing if the lay public were encouraged to take a little more interest in their general health (excluding, of course, that minority who constantly consult doctors, and of whom we all have experience), and to submit themselves regularly for general examination? In America, we believe, this is a usual practice. It is the common experience of every medical man to see patients who wonder why they have been turned down by an insurance company on the ground of ill-health; possibly an examination reveals that the blood pressure is too high, that albumen or sugar is present in the urine, or that some other physical sign exists which apparently gives no inconvenience, but is the distant though definite signal of "rocks ahead."

We can foresee in the near future a state of affairs when every doctor will be compelled to give a written report to each patient, and when every patient will be provided with a medical "dossier," which he will keep in his own care—a procedure which would obviously be in the best interests of the patient.

This dossier will be produced voluntarily by the patient, when asked for by the doctor he consults. It will very greatly help the physician in his work, and will considerably aid in safeguarding patients against errors of diagnosis. Think, for instance, of the importance of recording the fact that a certain patient has a definite idiosyncrasy to some particular drug, or that another is a subject of hæmophilia. Records of exanthemata and vaccination would also be valuable.

It is obvious that there are certain drawbacks. A patient might resent a record that he had been a sufferer in his youth from venereal disease, but this could be got over in one case by merely stating that the Wassermann reaction had been absent or present on such-and-such a date, and other conditions could be indicated by

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similar indirect methods. Mention of the fact that the patient had been attended for alcoholism would also naturally be resented, but in drawing up the case-sheet some such indication as C_6H_5O could be used. It would probably not be in the best interests of the patient to mention the fact that he or she had been operated upon for malignant disease, but here again a subterfuge would have to be adopted.

We would suggest that the form of the case-sheet should be determined by a committee of leading physicians and surgeons, and that this committee should invite suggestions from the profession generally. The scheme should also be submitted to eminent laymen, and an opinion should be taken as to the legal responsibility of the medical man signing the dossier. This, in our opinion, should be a privileged document, and it should be made compulsory by law that every doctor attending a patient should ask to see the patient's case-sheet. If the patient did not possess one, it would then be the doctor's legal obligation to provide this, and to complete his signed report as indicated on that case-sheet.

In time these medical records would be of great value statistically, and might even be of considerable importance from a medico-legal point of view. The whole subject has a wide bearing, but there is no doubt that such a dossier would be invaluable to its possessor.

These lines are written in a provocative spirit, and we feel sure that our colleagues would one and all greatly appreciate the valuable aid rendered to the medical profession by *THE PRACTITIONER* if the Editor would kindly invite any of our brethren to send him an expression of their views on the question of adopting a medical and surgical dossier.

[I shall be pleased to receive expressions of views as invited above.—EDITOR.]

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of obstruction in the intestine, the exact nature of which must always remain unknown to us until we have opened the abdominal cavity. Accidents, amputations and emergencies will always be with us, though even these will be profoundly influenced by time and manners; for if the Peace Pact means anything, surgeons will have seen the last of the wholesale mutilations they witnessed in the Great War.

We can, perhaps, visualize the possibility of discovering a means whereby large purulent collections may be absorbed without operation, for instance, in empyema or liver abscess; or better still, we may find out how to prevent the formation of such collections by protective influences, after the manner of vaccination. Such a thing is no more impossible than was the banishing of smallpox by the original vaccination introduced by Jenner.

We can quite understand that methods may be found of treating gastric and duodenal ulcers which would obviate a large part of abdominal surgery. Physicians, indeed, are constantly seeking such means, and all the methods advocated are efforts in this direction.

The rapid rise in the number of appendices which give trouble or suppurate is of modern growth and is not without a cause. This probably lies in diet or methods of living, and the cause may be found or may pass away with changes in our mode of living without being discovered; the number of cases of appendicitis will then be reduced.

Many diseases may disappear, some may change their character completely, while others will alter in their consequences. For instance, typhus has gone, typhoid has been practically wiped out, diphtheria is not the scourge it once was. We need not mention the many tropical diseases which have lately been mastered, as, for instance, in the construction of the Panama Canal, where medical measures transformed a fever-stricken

The Reign of Radium : The Passing of the Knife.

By DUNCAN C. L. FITZWILLIAMS, C.M.G., M.D., Ch.M., F.R.C.S.
Surgeon and Lecturer on Clinical Surgery, St. Mary's Hospital, etc.

I SUPPOSE it is the secret hope of all of us, both medical practitioners and laymen, that we shall pass through life without a serious operation, or if we have already had one, that we shall avoid another. In former days the practitioner dreamed of the time when discoveries would be made to do away with the few operations which then took place, just as it was the dream of his predecessors who peered dimly into scientific problems in still earlier times that one day the Philosopher's Stone would be discovered and with it the secret of perpetual life.

During the last fifty years the surgeon has taken rather a different view, and has done his best to widen the scope of useful surgery to its farthest limits. Some may even have gone beyond that and striven to leave their name attached to a particular operation, whether useful or not. In any case, the dream of the surgeon has certainly not been towards limiting the use of the knife.

There are now signs, however, that surgery by the knife has reached its limit. Every region has been invaded, every cavity opened with impunity, and some, perhaps, are treated with a rashness that is fortunately not recognized by the patient.

There are serious and insurmountable difficulties in the way of the complete abolition of surgery by the knife. For instance, we shall never be able to relieve strangulated hernia by any other means, nor can we hope to circumvent the many purely mechanical means

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of obstruction in the intestine, the exact nature of which must always remain unknown to us until we have opened the abdominal cavity. Accidents, amputations and emergencies will always be with us, though even these will be profoundly influenced by time and manners; for if the Peace Pact means anything, surgeons will have seen the last of the wholesale mutilations they witnessed in the Great War.

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area into a dwelling-place for the white man. All the recent discussion as to whether a certain epidemic was really smallpox or not was due to the fact that the disease had become so modified that it had lost all its deadly characteristics. Syphilis, again, is a disease which has become profoundly modified in its consequences. Where are the syphilitic bone lesions and disfigurements which were so common a generation ago? Where are all the aneurisms, the study of which brought fame to so many? They do not exist—chiefly, in this case, as a result of the modern treatment. We have noticed, too, the gradual disappearance of most of the operations for the correction of rickety deformities. Many other instances of the decline of surgery by the knife could be given.

Cancer is the disease in which, above all others, efforts have been made to replace the knife by other means of treatment. Chiefly, it must be owned, by the unorthodox practitioner, the medical profession recognizing only too well that the knife has, up to now, been the only cure. Human nature has shown in this disease more than in any other its dread of the knife and its inherent wish for any other method of treatment, hence the enormous amount of quackery with which this disease has been surrounded.

Five years, two, and even one year ago surgeons taught that the knife was our only hope in cancer. That teaching is still widely held. Yet there is no doubt that in five years' time the knife will be of very secondary importance in the treatment of cancer. This is no prophecy; it is already a fact, and has been known for several years to those who have had a wide experience of malignant disease. Attempts have been made from every angle to solve the mystery of cancer; shouts—hardly of victory, but of approaching victory—have been raised by enthusiasts from time to time, but these have invariably been false. Shouts of

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approaching victory usually are false—they remind one of the shouts raised by the Swedes early in their disastrous battle of Pultava. It can truly be said that we have discovered nothing in all our investigations which would lead an impartial judge to believe that we are one whit nearer solving the puzzle. Nor need we solve it in order to treat the disease, for though little advance has been made upon the scientific side in solving the secret of the cause, vigorous onslaughts have been made from the clinical side in our methods of treatment, and here great progress has been made.

X-rays have been used a great deal in the alleviation of cancer—perhaps cases have even been cured through it, though it is difficult to say. My opinion of the value of X-rays in this connection, however, is not very high, though few surgeons have used them more extensively. It seems that the real usefulness of X-rays lies in the treatment of internal growths, which cannot well be treated by other methods. Here, however, mechanical difficulties will always limit its use, as we cannot tell where small metastases are. At the present moment it is impossible to give a dose sufficient to destroy all the cancer cells in the body without a result fatal to the patient. External cancers, on the other hand, can be treated more surely and with less risk and upset to the patient by other methods.

I have said more or less the same thing about X-rays for many years, and have sometimes been hauled over the coals by X-ray enthusiasts for doing so.

Among the medical profession there are many who believe that X-rays and radium are much the same thing because of the similarity of the rays. Nothing could be farther from the truth.

For example, in all my experience I have never seen the slightest benefit to secondary growths of squamous carcinoma from such treatment; on the other hand,

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employed in their use. Moulds of the surface in soft wax-like material are made, on the interior of which the plaques of radium are fixed, and the patient wears these moulds for so many hours a day until a sufficient dose has been given. These moulds can be used for both primary growths and for glands, but in the latter case still better results are obtained by dissection, where that is feasible.

Radium is used for the treatment of primary cancer in various parts of the body. In the tongue, radium in needle form has largely replaced the knife except in special cases. The glands of the neck, it is true, must still be treated by block dissection. The excellent results obtained at the Curie Institut at Paris by Professor Regaud are being achieved in this country, where the same method is followed. In tongue cancer the number of three- to five-year cures by radium already equals if it does not surpass that of cures by the knife alone. Think of the advantage to the patient of having his disease cured and his tongue still left intact!

Carcinoma of the rectum is now largely treated by radium, though operation is necessary in order to expose the growth fully and insert the needles in such a way that a complete barrage is created round it, but the knife has here been given second place, and is regarded only as an adjunct to the radium, and not vice versa. Cure in such cases does not restore normal function, it destroys the growth, but as a rule cicatrices the bowel and a permanent colostomy must be established beforehand.

In breast carcinoma radium has long reigned supreme for the treatment of secondary growths which can be completely and surely dispersed by it. It has also been used for a long time to check the advance of inoperable cancer of the breast which is too far gone to offer any hope of cure. Excellent results follow its

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I have seen great harm ensue.

I fancy that this is the opinion of most radiologists, certainly of those to whom I have spoken.

In external or accessible cancer, however, we have now an excellent means of treatment other than the knife—radium, which is gradually being recognized as an instrument whereby cancer cells can be adequately destroyed. Radium has now fully established its superiority to X-rays and is entering on a struggle for supremacy with the knife. In my opinion, it is bound to conquer.

Radium can be used in various ways. Either as seeds containing the element radium, in which case they are attached to silk threads and must be recovered after a certain time, or they may contain emanations of radium which will gradually evaporate in the course of three weeks and can therefore be left *in situ*; or it can be used in needles of various lengths containing 2 to 5 mg. of radium, to which thin wire is attached, and these are removed after the necessary dose has been given. Similar needles containing emanations can be employed, but must be left in for a longer time, as their energy dissipates. Tubes containing 30 to 50 mg. of radium are useful for cavities such as the cervix uteri or œsophagus. At one time these were inserted in the centre of tumours, but this method has been abandoned. The use of these tubes combined with needles is excellent.

It is now recognized that the active growing part of a tumour is its edge, and that the interior is composed of old and probably degenerating cells. It is to the growing edge that our attacks must be directed.

Lastly, radium or radium emanations can be applied as plaques to the skin or mucous surfaces of the body. Considerable experience is needed in their use. They must be carefully screened and separated from the surface by a certain distance, and special apparatus is

THE REIGN OF RADIUM

employed in their use. Moulds of the surface in soft wax-like material are made, on the interior of which the plaques of radium are fixed, and the patient wears these moulds for so many hours a day until a sufficient dose has been given. These moulds can be used for both primary growths and for glands, but in the latter case still better results are obtained by dissection, where that is feasible.

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use in these cases, the masses to which it is applied disappear, others, of course, appear later, and cures are not expected. Gradually feeling one's way, radium was first used timidly for the treatment of earlier operable cases of carcinoma of the breast. Now its use in this connection is fully established. I have one patient in whom I used radium over three years ago and she is now alive and well without the slightest sign of disease, locally or elsewhere. Since then I have treated many breast cancers in a similar way, and the results have been quite as good as with the knife. This is an enormous advantage to the patient, who is saved from the terrible disfigurement of an extensive breast operation. Not only so, but there is another effect which cannot too strongly be emphasized.

We are continually preaching that cancer in the early stages is a local disease and easily curable at that stage. Unfortunately, we cannot get people to come in the early stages—many patients still hide the disease for months. Why? Those of us who see much breast cancer recognize only too well the psychological effect on a woman of the discovery of a lump in her breast. We know what paralyses her as surely as the weasel paralyses the rabbit—it is the vision of the knife and no hope but the knife. Do away with that dread and she will come to us early and willingly, and we shall have made the greatest stride towards the mastery of the disease that has been made in the last century, for the key to the cure is early diagnosis and treatment.

I believe that the time will come very shortly when the modern breast operation will be performed by no one who has acquired the technique and who has an adequate supply of radium within reach. Considerable experience in the use of radium is necessary, for it is far more dangerous in unskilful hands than a knife is in the possession of the most careless slasher.

It is difficult to see how this special knowledge can become general, or how an expensive substance like radium can be distributed broadcast throughout the country. It is probable that the solution of this problem will be the establishment of cancer treatment centres in various parts of the country, to which patients can be referred by their doctors.

Carcinoma in other regions will soon be attacked. Pyloric cancer will be exposed by operation and a gastro-enterostomy performed, the radium embedded, and a week later the stitches removed and the radium recovered. Or if seeds are used, perhaps they will be left in permanently, so avoiding a second operation. If the pylorus can be treated there is scarcely an area in the body which cannot be dealt with in the same way, and we shall see the disappearance of all the present-day radical operations upon cancer. The radical operation on the breast, Wiertheim's operation of the uterus, the excision of the stomach and the large bowel, all will be abandoned. Indeed, Wiertheim's operation is considered obsolete by some authorities already, and acrimonious discussions are being conducted in the medical Press between those who are farseeing enough to recognize the trend of events and those who do not yet see that the knife is becoming only of secondary importance. Time will decide very soon which side is right.

Then a revolution will have taken place—radium will have come into its own and will reign supreme, with the knife as its lieutenant. If such a change takes place within our own time, who can foresee the other changes which will be achieved in our restless, yet ever progressive art of healing ?

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is hardly necessary to say that a sad disproportion exists between the former and the latter in almost all quarters in this country.

Before proceeding to outline briefly the methods adopted in the treatment of cancer in the differing spheres of general surgery, gynæcology, laryngology and dermatology, it might be of service to explain what is meant by the "surgery of access," and to what extent this has been responsible for the improvement of results in certain sites, particularly in the case of deep-seated tumours, e.g. cancer of rectum. The "surgery of access" might be described as the culminating point of a series of steps, or periods, in the evolution of the treatment of cancer by radium.

In the first period, treatment was essentially accomplished from the surface by means of plaques and large containers, the limitations of which require no stressing. This was followed by the second, the period of radium puncture, in which was the attempt to procure a homogeneous radiation of the malignant mass. This represented a considerable advance, but still there remained a large number of growths, particularly those deep-seated, in which needling or homogeneous radiation was impossible. This led to the "surgery of access," the present period of radium surgery, to which, in certain sites, the improvement in results now obtainable is to a large extent due. The three distinct principles of radium surgery thus evolved are:—

- (1) The opening up of a way to the tumour.
- (2) The accurate introduction of radium needles into the tumour itself.
- (3) The application of radium to the lymphatic areas draining the tumour.

Non-operative methods are sometimes used in conjunction with operative procedures, and comprise, among others, deep gamma radiation by cannon apparatus, surface radiation by radium at distance,

Radium in Cancer: Modern Operative and Non-operative Methods.

By ARTHUR B. SMITH, M.B., F.R.C.S.,

AND

SYDNEY M. SMITH, M.B., Ch.B.

London, W.

THAT radium at the moment occupies a prominent place in the treatment of cancer is largely to be accounted for by the results which it has been possible to show are obtainable by certain techniques of its administration. These techniques are in their turn the product of the efforts which followed the discovery of the limitations of the methods used in earlier days. Adequate supplies of radium, large numbers of patients, careful recording of cases and efficient follow-up systems, and perhaps most important of all, a critical attitude towards methods adopted, are features which characterize certain of the radium clinics abroad, clinics in which much of the pioneer work in this subject has been done. Prominent amongst these are the clinics of Paris, Stockholm and Brussels, and it is a significant tribute to the influence of the work of these particular schools that their techniques are now being so largely adopted in this country. It has been our privilege to demonstrate some of these newer methods in certain medical centres and to help in arranging for radium and apparatus suitable for their adoption. Being thus frequently in personal contact with surgeons in different parts of England and Scotland it is possible to speak with some authority both on the question of existing needs and supplies of radium. It

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cells during the period of mitosis and to render local necrosis with its susceptibility to infection less liable. Monod and Roux-Berger, colleagues of Regaud, find radium superior to X-rays, and surgery inferior to radium, in the treatment of these tongue carcinomata, and in view of their results, their technique is worthy of note. They follow the principle of a small dose for a long period, and the treatment consists of two parts: the needling of the primary growth in the tongue and the simultaneous radiation of the neck by means of a wax apparatus on the principle of radium at distance. This wax apparatus must be translucent to primary rays and opaque to secondary rays. The arrangement of the needles in the tongue is important, the rule to be followed being to allow 0.5 to 1 m.c.d. per cubic centimetre of area treated.

In our own experience we have found two points to be of considerable importance both as regards the end results and the comfort of the patient during treatment:—

(1) The use of needles of adequate radio-active length.

(2) The secure anchoring of these to the substance of the tongue.

The exposure lasts for approximately eight days, and dosage is determined according to the site and extent of the lesion; thus, for a small lesion on the side of the tongue, it should approximate 15 m.c.d.; for a lesion involving a part of the substance of the tongue, 20 to 25 m.c.d.; and for lesions involving the whole tongue, 30 m.c.d. When the lesion involves the infra-lingual or the posterior dorso-lingual region a combined needling and surface radiation may be utilized. A mould is made of special wax and the radium is situated at 3 to 4 mm. from the surface, lead protection being provided for the surrounding buccal cavity. Dosage in this case is estimated to provide

and simple radiation by surface applicators. By the introduction of these methods, means are available for the treatment of inoperable growths, while the important work of pre-operative and post-operative prophylactic radiation can be effectively undertaken.

CANCER OF TONGUE.

Treatment in cancer of the tongue is based on one of two principles—a large dose over a short period, or a relatively small dose over a long period.

Thus treatment may consist of:—

(1) Large dose given over a short period of twelve to forty-eight hours according to the filtration and needle-content.

(2) Relatively small dose given over a prolonged period of some days. In both of these techniques the radium is contained in platinum needles, the filtration and length of which are important factors.

(3) Introduction into the substance of the growth of “seeds” which, owing to the intense beta radiation, produce considerable local destruction. The “seeds” are left in permanently.

(4) Introduction of platinum “seeds” of low content which are subsequently removed.

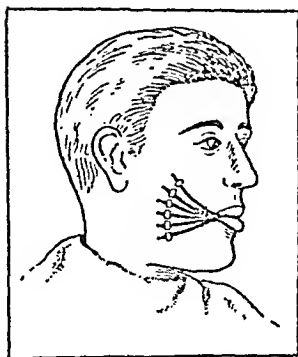


FIG. 1.—Cancer of tongue. Method of anchoring, externally, the radium needles *in situ* in the tongue. (After Regaud, Paris.)

(5) Needling of the primary growth (as No. 2 above), combined with a simultaneous subjection of the lymphatic area of both sides of the neck to a continuous homogeneous gamma radiation—radium at distance. (Fig. 1).

Regaud,¹ of Paris, who favours a small dose over the long period, does so in the belief that it may be assumed to kill more

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one-seventh of a millicurie destroyed per square centimetre of surface treated.

The secondary invasion of the neck, as has been said, is treated by means of a surface apparatus, but here the question of associated surgical intervention arises. Where clinically there is little doubt of the presence of cancer, extensive dissection with removal of the sterno-mastoid and internal jugular vein is associated with the surface radiation. The aim of the radiation from a distance is the sterilization of the affected area without injuring the skin. The dose varies according to the filtration, the distance of the application, and the extent of the surface to be irradiated; but at a distance of 3 cm., one must not destroy more than two millicuries per square centimetre treated. Since 1925, however, the question has arisen of increasing the distance in relation to dosage, which is an indication of the difficulty of dealing effectively with secondary invasion in this region. In Regaud's¹ five-year period, 1920-1925, 46·3 per cent. remained cured of the local lesion in the tongue. When taking into account glandular-recurrences, the percentage of complete cures was 26·8 per cent., itself a remarkable figure.

CANCER OF ŒSOPHAGUS.

The long experience of Guisez (Paris) in the treatment of carcinoma of the œsophagus commands attention to his technique and results. He finds that results are good when the disease is limited to the wall of the œsophagus, and requires this to be evidenced by the absence of: (1) signs of pressure on the recurrent laryngeal nerve; (2) of enlarged tracheo-bronchial glands; and (3) demonstrable metastases. His method includes direct-vision œsophagoscopy, during the performance of which bougies are introduced to dilate up the stricture prior to the subsequent introduction

RADIUM IN CANCER]

of the radium-containing bougie (Fig. 2). The radium is placed in the tubes in series to allow radiation beyond the limits of the growth and has filtraged of 1 mm.

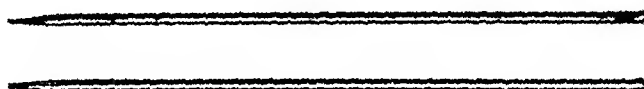


FIG. 2.—Cancer of cesophagus. Radium-containing bougies for introduction through lumen of growth. (After Guisez, Paris.)

platinum and 1 mm. gum. The applications, each of six or seven hours, are repeated every second or third day until the dosage of 20.62 m.c.d. approximately has been given. During the past fifteen years Guisez's figures show patients, in whom cancer was diagnosed by preliminary biopsy, remaining cured up to periods varying from one to two, four, four-and-a-half, six and fourteen years.

CANCER OF THE BREAST.

Technique in the treatment of cancer of the breast shows considerable variation according to the nature and extent of the lesion and symptoms present. Thus the problem to be dealt with may be completely inoperable cancer, isolated superficial or deep recurrent nodules, widespread recurrence, localized recurrence causing pain by pressure on nerves, and metastasis in bone, particularly in vertebræ. Also, as with fungating masses elsewhere, radium may be called on specially for its hæmostatic effect and for control of discharge. In the sphere of breast cancer increasingly satisfactory results are being obtained from the techniques now employed, and we can count among our own cases, results which, both in terms of disappearance of growth and of alleviation of symptoms, are most encouraging. In respect of palliation, amongst the most interesting have been cases of extensive superficial ulceration in cancer-en-cuirasse, where, following treatment by

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radium, we have been able to secure complete hæmstasis, cessation of discharge and healing of the ulcerated surface. These were cases in which hæmorrhage and discharge were most distressing symptoms.

In view of the results in inoperable and in certain operable cases, the question naturally arises whether the time has yet arrived when radium may legitimately be recommended in place of surgery. What is clear—and there is considerable unanimity of opinion on this point—is that post-operative radiation by radium, with the wide area of cellular sterilization which it can effect, should be more extensively used than it is. Similarly, there is much to commend pre-operative radiation, to render “sterile,” as far as possible, the area of operation, and in other cases to render operable those cases which are on the border line of operability. The treatment of cancer of the breast by radium may roughly be divided into two types: (1) needle introduction and (2) surface application.

(1) Needle introduction, with which technique

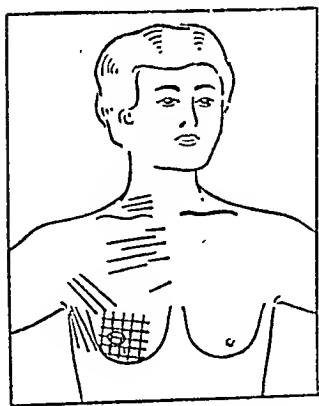


FIG. 3.—Cancer of breast. Needle-introduction method. Low-content radium needles introduced throughout the extent of the growth and the lymphatic areas draining it. After Neuman and Coryn, Brussels.)

the names of Neuman and Coryn³ (Brussels) are specially associated (Fig. 3), aims, by the appropriate introduction of low-content radium needles and their retention over a considerable number of days, at the destruction of the original growth and the sterilization of the whole lymphatic area draining it. Thus needles of appropriate length and filtration are introduced (as shown in diagram) into the region of the growth itself, and into the following lymphatic areas: (1) pectoral,

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(2) axillary, (3) intercostal, (4) infraclavicular, (5) suprafraclavicular. At the termination of the exposure the needles are withdrawn.

(2) Surface application is effected by the construction of a mould of wax (or a series of wooden blocks on fabric) on the principles described more fully above in cancer of the tongue. The radium is maintained at a definite distance from the skin surface, and is so distributed that the malignant mass and the whole of the lymphatic areas draining it are subjected to a continuous and homogeneous bath of gamma radiation

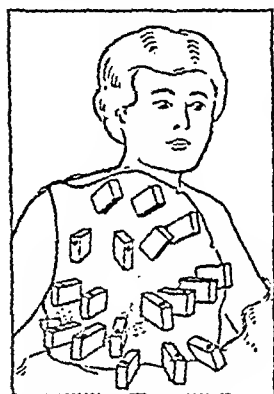


FIG. 4. — Cancer of breast. Surface application method. Growth and lymphatic areas treated by moulded apparatus supporting radium at distance, on blocks. (After Sluys, Brussels.)

(Fig. 4). The dose may amount to between 500 and 600 m.c.d., but, despite this extensive radiation, there is little risk of skin destruction, bone necrosis, or marked general reaction (Sluys).

In relief of pain associated with pressure of a malignant mass, or of recurrent nodules, on nerves, surface radiation of considerable strength is employed.

Still more powerful radiation in cases of inoperable cancer of the breast is obtained by the methods employed by Monod and by Sluys. The former makes use of 4 grammes of radium element distributed over an area of some 159 square centimetres and at several centimetres from the skin, while the latter employs several grammes of radium so distributed that 13 beams of gamma rays can be focused on the selected area.

CANCER OF THE RECTUM.

In the treatment of rectal carcinoma there are essentially two schools of thought: the one in which a

relatively large amount of radium in the form of needles or tubes is introduced for a short period into the rectum via the natural passage, and the other in which recourse is made to the surgery of access. A modification is the introduction of platinum or glass seeds into the growth. The former are subsequently removed. In the operative method, following upon a preliminary colostomy, access is gained by a posterior sacro-anal incision and removal of coccyx. The tumour is thus

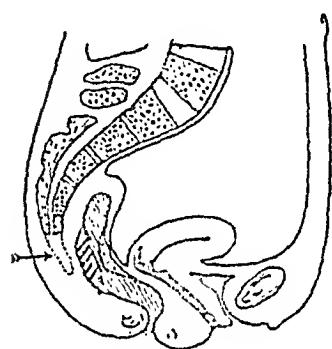


FIG. 5.—Cancer of rectum. Showing distribution of radium needles in growth and lymphatics after operation of access. (After Neuman, Brussels.)

exposed and multiple radium needles of low content (Fig. 5) introduced, not only throughout the substance and periphery of the growth, but along the line of the superior, middle, and inferior hæmorrhoidal lymphatics. Operative shock is practically nil. The three principles of the surgery of access already described are well demonstrated in the treatment of this type of tumour.

Neuman⁴(Brussels) reported on 40 cases of carcinoma of rectum (31 ampullary and 9 ano-rectal) treated in this manner between 1922 and 1924. Of these 40, 21 remained cured for two years, 11 died, 4 recurred, and 4 were lost sight of. The dosage should approximate 40 m.c.d. over a period of five to seven days.

CANCER OF PROSTATE, BLADDER AND STOMACH.

There is not space here to do more than mention that in these sites the techniques show considerable variation from the relatively large dose over a short period to the small dose over a long period in the case of radium introduction. In these sites, there is also a field for

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what is termed deep gamma therapy.

CANCER OF TONSIL.

In this site the growth may be attacked in several ways:—

(1) Introduction to the growth itself of radium needles, tubes, or small platinum seeds which are subsequently removed.

(2) Application of heavily-screened radium to the



FIG. 6. — Cancer of tonsil. Apparatus designed for accurate apposition of radium to growth, also showing saliva ejector and jaw splint. (After Berven, Stockholm.)

surface of the growth in the manner shown in diagram (Fig. 6), Berven⁵ (Stockholm). We have personally found this apparatus most useful in the treatment of tonsillar, palatine, and pharyngeal cancer, and in some cases have used it in post-operative prophylactic radiation following surgical removal of tumours of the mouth.

(3) Combined internal and external surface gamma radiation to obtain cross-fire radiation of the growth.

CANCER OF LARYNX AND PHARYNX.

Laryngeal tumours from the point of view of radium treatment can be divided into three groups (Ledoux): (1) Extrinsic or laryngopharyngeal; (2) intrinsic with infiltration of the arytenoids; (3) intrinsic, which involve only the anterior segment of the larynx.

In the first and second groups, recourse may be made to radiation by surface apparatus or to surgery. In the latter case the organ is sacrificed anatomically, while in the former it is sacrificed functionally owing

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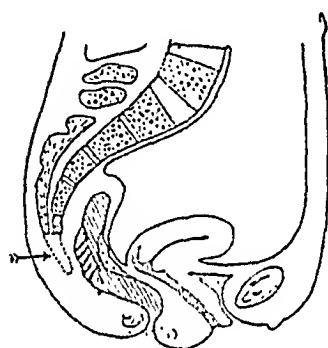


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tribution of the radium in and about the growth;
(2) in the method of obtaining the total required number of milligramme hours, either (a) by large doses over short periods, or (b) by small doses over long periods;
(3) filtrage of radium.

The following indicate the various means of distribution of the radium :—

(1) Uterine tubes supplemented by applicators in vault of vagina—Heyman, Stockholm (Fig. 7).

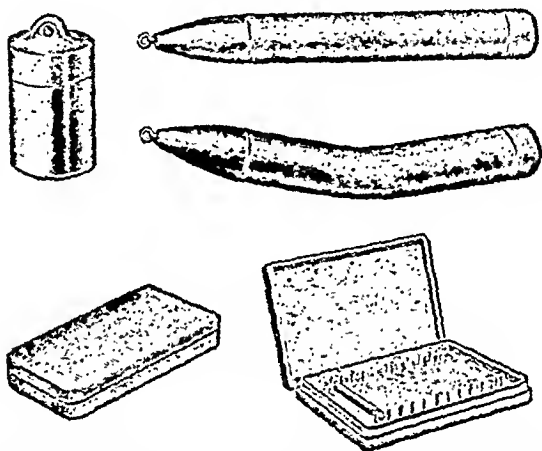


FIG. 7.—Cancer of cervix. Intrauterine tubes, vaginal cylinder and flat applicators used in the technique of Heyman, Stockholm.

(2) Colpostat of Monod, Paris (Fig. 8), in which radium is contained in cork segments which are retained in the vaginal vault by pressure of a spring. Intrauterine tubes are employed in conjunction with this.

(3) Uterine tubes, combined with radium-containing needles introduced into the substance of the growth from the vaginal surface (Brussels).

(4) Vaginal applicators alone.

(5) Rubber ring pessaries in which radium is contained (Nabias).

(6) Uterine tubes alone.

(7) External irradiation by means of several grammes

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to changes in the crico-arytenoid cartilages and fixation of the vocal cords. In the third group, diffuse radiation is to be condemned. Hence fenestration of the larynx is performed to permit of radium puncture of the tumour. This avoids attack on the crico-arytenoid articulations, although the thyroid cartilage may not be entirely immune from the danger of necrosis.

In cancer of the pharynx the prognosis is notoriously bad; but, treated on the principle of surface irradiation, Regaud has been able to show a certain degree of success. The alternative to this technique is the surgical introduction of radium-containing needles. Berven, of Stockholm, combining it in some cases with needling of the growth, employs radium at distance by means of a "cannon" apparatus. By suspending the apparatus by adjustable cords from a wooden frame, the amount of secondary radiation from metallic structures in proximity to the radium is minimized. An alternate method is the introduction to the growth of removable platinum seeds.

CANCER OF SKIN.

Superficial tumours of the skin may be treated effectively by: (1) the introduction of radium needles; (2) by combined needling and screened surface application; (3) by screened surface radiation alone; or (4) in certain cases by unscreened surface application. In each case a careful estimation of dosage, in relation to the type and extent of the tumour, is especially important. This is a field in which excellent results may be anticipated.

CANCER OF CERVIX.

The technique of radium in the realm of gynaecology shows considerable variation in the different schools abroad. In the case of cancer of the cervix the differences consist mainly: (1) In the manner of dis-

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tribution of the radium in and about the growth;
 (2) in the method of obtaining the total required number of milligramme hours, either (a) by large doses over short periods, or (b) by small doses over long periods;
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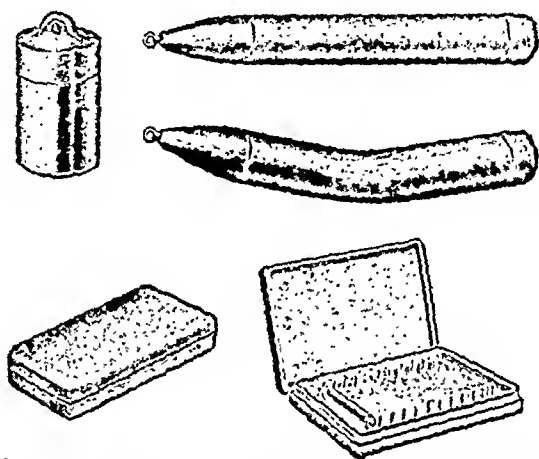


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of radium at several centimetres distance from the skin and through several ports of entry, in conjunction with utero-vaginal application (Regaud, Paris).

It is a matter of importance, both technically and

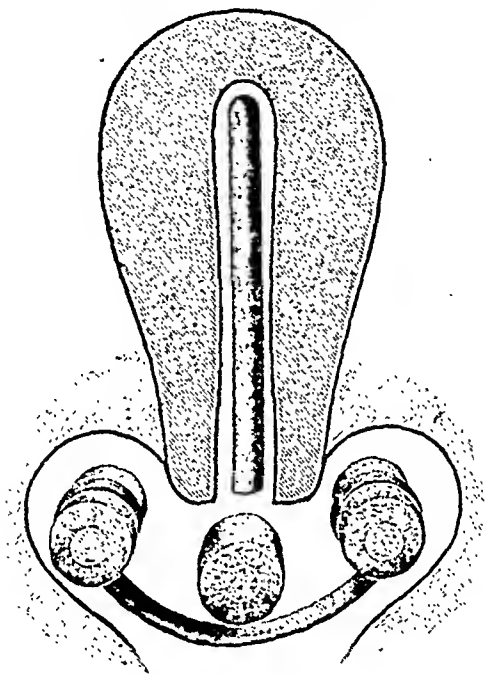


FIG. 8.—Cancer of cervix. Colpostat apparatus, showing disposition of radium in uterus and vagina. (After Monod, Paris.)

from the point of view of economy of radium in arranging radium for gynæcological purposes in hospital—and this is a point in which we have taken particular precautions in arranging our own radium—that its component parts when dissembled are suitable to meet the needs of work in general surgery and the other specialties. Otherwise this radium would have limited use outside of gynæcology.

A review of the literature of results of many different schools points to the fact that in cervical cancer a minimum dose of 5,000 milligramme hours must be given if good results are to be obtained.

On the grounds of numbers treated and the complete-

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ness of the subsequent records of cases, the work of the Radiumhemmet, Stockholm, is of particular interest. Here, Heyman² is able to report during the subsequent five years on almost 100 per cent. of cases treated. This is to a great extent due to the fact that the Swedish Government pays the travelling expenses of poor patients to and from the Radiumhemmet, and also to a thorough and minutely organized follow-up system and control of patients.

The technique followed at this centre in cervical cancer consists in three applications (combined intrauterine and vaginal) of twenty-two hours each (Fig. 7), the second a week after the first, and the third about two weeks after the second. The filtrage of the intrauterine tubes and vaginal applicators is the equivalent, in silver and lead, of 3 mm. lead. The amount of radium element in each application is approximately 30 mg. in the uterus and 70 mg. in the vagina. The total dose over the three applications is approximately 6,000 milligramme hours.

Heyman's statistics for the period 1914-18 show, in operable and borderline cases, 40·5 per cent. still free from cancer after five years, and 60 per cent. after three years. Of inoperable cases treated during that same period, 16·6 per cent. were free from disease after five years. The primary mortality was 1·19 per cent. Heyman has done much to dissipate the fallacy that the mere possession of radium is, in itself, sufficient to procure good results, by making the observation that the figures for 1916 in the Radiumhemmet fell markedly when he first took over complete control of the work previously undertaken by Professor Forssell. This marked fall occurred in spite of the same radium and the same applicators being used in the treatment of the same types of patients, which fact forced him to the conclusion that to achieve success in treatment—

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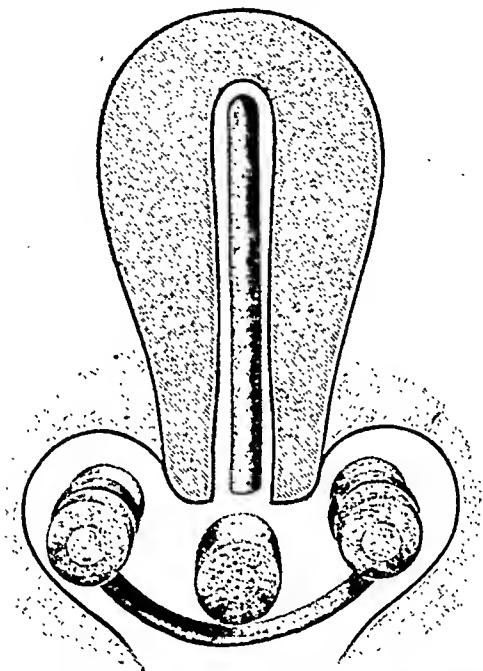


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On the grounds of numbers treated and the complete-

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in some areas suggest that it is now no longer necessary to regard "inoperability" as always synonymous with "incurability."

(2) Considerable unanimity exists amongst authorities that radium should be more extensively used for pre- and post-operative prophylactic radiation.

(3) The possession of radium is not alone sufficient to procure results of the nature described above, but an accurate knowledge of the technique of administration, of dosage in relation to type of tumour, filtration of rays, and, in certain sites, of the surgical approach to tumours and their associated lymphatic areas, are essential factors to the procuring of such results. Herein lies the field of the radium surgeon—the radiologically-trained surgeon who can combine radiological and surgical technique in his own repertory.

(4) The need for knowledge on the proper administration of radium is as pressing as the need for radium itself, and in view of the impending widespread increase in activity in radium work in this country, the introduction to the curriculum of all teaching centres, of instruction on this highly specialized subject is called for. Further, the need arises for the establishment of hospitals or clinics for the full-time study of radium in the treatment of operable and inoperable cancer, and where this is not possible, the relegation in existing hospitals, of certain wards or accommodation, adapted and equipped entirely for this purpose.

(5) To be content to continue, in face of the known potentialities of radium as an agent in the combating of cancer, with the grossly inadequate supplies of radium at present available for the majority of hospitals in the country, would be to play with an issue which, like the increasing incidence of cancer, is of national moment. The securing of radium commensurate in amount with the task of dealing effectively with this

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and this applied to other fields than gynæcology—one must possess not only radium, but that clinical judgment which is alone begotten of experience and constant practice. We would like to record here our indebtedness to Dr. Heyman for much personal help and guidance.

The Brussels technique, of needling of the cervical growth combined with intrauterine application, has, over the five-year period 1919-24, given results which are less successful than had been anticipated, and has been discontinued.

The technique employed by Monod (Paris) secures a satisfactory distribution of the radio-active material by means of several equally strong, but relatively feeble sources of radiation. Fig. 8 shows his colpostat apparatus, in which the uterine applicator contains two or three tubes of radium, filtered by 1 mm. of platinum, aluminium and rubber, while the vaginal sources are distributed in three tubes shielded by 1 mm. platinum, aluminium, and several millimetres of cork. Two of these tubes rest in the lateral fornices, while the third rests against the cervix. The exposure is arranged to give a dosage of approximately 30 m.c.d. in the uterus, and 30 m.c.d. in the vagina, the period occupied being from three to five days.

In the realm of gynæcology, and particularly with the technique of Heyman, of Stockholm, it would seem almost justifiable to say that "inoperability" need now no longer always be regarded as synonymous with "incurability."

SUMMARY AND CONCLUSIONS.

(1) In the treatment of primary cancer in certain sites (e.g. tongue and cervix), radium may now take—and, in fact, has largely taken—the place of surgery. In other sites a combination of surgery and radium is indicated. Further, the results obtained by radium

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in some areas suggest that it is now no longer necessary to regard "inoperability" as always synonymous with "incurability."

(2) Considerable unanimity exists amongst authorities that radium should be more extensively used for pre- and post-operative prophylactic radiation.

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incidence is beyond the scope of private donation or local subscription alone. In some of the larger and wealthier towns this might more nearly be possible. The debt must at once be acknowledged to what has been done up to now, by radium presented or subscribed for in this way, to give it its present status and to demonstrate its potentialities. But cancer unfortunately is not confined to such areas. The problem is national, calling for the augmenting, or the entire providing where necessary, of local supplies on a national basis. Indeed, the idea of such a national attack on cancer, on the lines of the co-ordination of existing radium centres with other hospitals and Poor Law institutions adequately supplied, is no longer a matter of mere fantasy. Its realization is now more than a distant possibility.

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Prurigo, Pruritus and Lichenification.

By H. HALDIN-DAVIS, M.D.

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THE conditions discussed in this article include a heterogeneous collection of cutaneous affections bearing no relationship of any kind to one another. The sole common factor to which they all owe their consideration within a single hour is the fact that they cause the unfortunate patient severe irritation. *Prurigo* forms, perhaps, a more definite clinical entity than the others, being usually understood to imply a definite cutaneous syndrome starting so early in life as to merit the term "congenital." It was first described by the celebrated Viennese dermatologist, Hebra, who published a series of cases in which the limbs were beset by numbers of small papules affecting the extensor more than the flexor surfaces, in which the face was also involved, and which was accompanied by a general enlargement of the lymphatic glands. Whether this enlargement is to be considered as a primary characteristic of the disease or whether it is to be attributed to the septic absorption consequent upon continual scratching still remains uncertain. The patients were emaciated, pale and exhausted by the ceaseless discomfort of their condition, and all Hebra's cases having eked out a miserable existence for a few short years were ultimately released from their sufferings by an *exitus letalis*. Such a malady was rightly characterized by the adjective *ferox*. It appeared, however, after a time that there were other patients who, although in all other respects apparently afflicted by this disease, refused to comply by dying the

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clinical picture drawn by the master, and, in fact, even went so far on the approach of puberty as to exhibit great improvement, almost amounting to recovery. The swollen glands subsided, the thickened and leathery skin became more supple, leaving merely a certain amount of scarring and pigmentation as a memorial of former sufferings.

To include these milder cases a second division of the disease prurigo was established, bearing the appropriate adjective *mitis*, and it may as well immediately be stated that the second variety is by far more common than the first, although itself only rarely met with. I can only recollect two cases of prurigo within my own experience, both occurring in Jewish patients whose families were but recently arrived from Eastern Europe (the typical source of the disease), both belonging to the *mitis* group. One of these cases I have been able to watch grow up, and the other is now adolescent. In the course of years great improvement has taken place, and although of small stature they are fairly normal individuals. The chief interest in such cases lies in the possibility that they may be confused with the very common affliction of infancy, known as lichen urticatus or papular urticaria, now beginning to be regarded as a sensitization phenomenon of the patient to its environment. These, however, are not the only conditions bearing the designation prurigo to be found in dermatology. There are at least two others—the prurigo of Besnier and prurigo nodularis. They serve to mark the peculiarities of dermatological nomenclature, for neither of them has any connection whatever with the true classical prurigo above described. The prurigo of Besnier is characterized by the development of irritating papules in the flexures, and may be regarded as the condition which, in adults, corresponds to the flexural eczema of infants and children. Prurigo nodularis consists of lesions which can best be de-

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scribed as hard weals which persist for some time, fade away slowly, but are succeeded by fresh relays of nodules of similar character. They tend to affect a particular area only and form an extremely chronic affection. I have one patient who has had this condition affecting one thigh only over a period of about five years. Both these afflictions are now said to be allergic phenomena.

We now come to consider the word *pruritus*. This is really a mere translation into Latin of the English word itching, and therefore signifies no disease properly so-called, not even a clinical syndrome, but simply a symptom common to a great many dermatoses. Those who suffer from scabies, eczema, lichen planus, sometimes from psoriasis, and many other skin affections all itch, and therefore all suffer from pruritus. But in addition to such affections there are a number of cases in which there is no obvious dermatological cause for the symptom (which is none the less distressing), and then we cloak our ignorance by accepting the name of symptom as the diagnosis of the disease, and the patient is said to be suffering from idiopathic pruritus. Pruritus may be either general or localized. Generalized pruritus occurs as a symptom of many systemic conditions. Perhaps the commonest is jaundice, presumably because some of the biliary constituents irritate the skin. It is also found to occur in some cases of leucocythæmia, even without the presence of obvious skin changes, which, of course, may also be present. It is also sometimes a symptom of lymphadenoma, especially in its terminal stages, and has been described as a symptom of lymphosarcoma, present before the removal of the growth, ceasing with its ablation and again recrudescent with the onset of recurrence. Such cases, however, are chiefly interesting as examples of the ways in which internal disease may be reflected on the skin. But there are also patients

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of this symptom by a short treatment with ultra-violet light. Probably this was effective by suggestion, and in point of fact, suggestion acting in one of its manifold agencies is often the most effective method of dealing with generalized pruritus, whether it be spa treatment, Christian Science or what not.

As regards localized pruritus, any region of the skin may be affected by pruritus, but the localities which are most often attacked are in the neighbourhood of the perineum, so much so that *pruritus ani*, *pruritus vulvæ*, and *pruritus scroti* have been elevated to the rank of definite diseases, or at all events are employed as diagnostic labels, behind which it is unseemly to pry, although in reality these terms again are merely the translation into Latin of the symptom complained of. Other parts which are also not uncommonly affected are the neighbourhood of the elbow or on the shin. What is the condition of the affected regions? As a rule they are the seat of changes which are commonly labelled under the term *lichenification*. That is to say, the cutex is thickened and somewhat œdematous, the natural lines are deepened and accentuated, and there is a certain amount of slow desquamation, and the colour is altered either to a more fawny tint than usual, or, if active inflammation be present, to the hue of congestion. In lichenification in the regions of the pudenda the area affected looks raised and grey and perhaps sodden. Another favourite locality for lichenification is the area of the scalp just below the occipital protuberance—it is sometimes familiarly known as "napex." It is more common in women than men and has been associated with the irritation set up by the use of hairpins. Under prevailing fashions one may expect its frequency to diminish; indeed, I believe it has already done so.

The exact nature of lichenification is somewhat obscure, but I think that it is best to follow Brocq and

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who suffer from what must be called idiopathic pruritus, patients who otherwise are apparently healthy, who are devoid of physical signs, in whom pruritus is the sole symptom. Such cases are, as a rule, labelled neurotic, except in the aged. This label is, indeed, not without its justification.

Among aged persons irritability of the skin is so well known that a special syndrome is described under the name of *senile pruritus*. It is very intractable. It has to be distinguished from eczema, which is also common among old people, and it must always be remembered that such patients must be carefully examined to exclude the presence of pediculosis corporis, which is occasionally found even among those of irreproachable social position. Pediculosis is always especially to be suspected when the patient is *suddenly* afflicted with pruritus. Senile pruritus is not quite the same as senile eczema, for in the former there are no visible inflammatory changes. It is alleged that in such cases the skin is dry and atrophied; but I have noticed that in several individuals complaining bitterly of irritation the skin was apparently in excellent condition considering their age, soft and healthily moist. But there was no doubt of the presence of pruritus judged by what I may term the acid test, i.e. interference with sleep. This forms a very good criterion of the severity of the case. However emphatic and pathetic the patient's story may be, one may add the salt of scepticism if good sleep is admitted, but bad nights prove the reality of their sufferings. It must be remembered also that pruritus is essentially a neurotic symptom, and hence is frequently brought to the notice of those who labour among the neurasthenic and psychasthenic. Recently I saw a patient resident with a medical man who specializes in such cases, and suffering from mild melancholia, who was also the subject of general pruritus. We cured him

PRURIGO AND PRURITUS

idiopathic pruritus, which are just as difficult to treat as those which are associated with lichenification. Actinotherapy is the chief hope. X-rays undoubtedly always relieve the condition whether associated with lichenification or not, and the method of application is the same. I find that the best results are obtained by giving half-a-pastille dose three times with an interval of two weeks between the doses. I wait four weeks and give a final half-pastille. In many cases this gives a permanent result, especially in cases of a duration not exceeding a year or eighteen months; but I am bound to confess that sometimes recurrence takes place, and then a second series of exposures is seldom so effective again. Sometimes a recurrence can be cured by radium, although X-rays have failed. With ultra-violet light I have been much disappointed; I have only found it give slight temporary relief. As regards treatment by local applications of lotions and unguents, some sort of greasy substance is necessary in all cases of lichenification to prevent the affected area becoming hard and dry, and not only irritated but sore and painful. Relief to the irritation is often found in the use of some phenol derivative, either carbolic acid itself in the form of a dilute lotion or incorporated in an ointment, or, as I have found most useful, in the form of liquor picis carbonis, which may be incorporated in an ointment or painted on undiluted. If employed in this way, however, it must soon be followed by the application of some fatty substance, e.g. vaseline or lanoline, to prevent the area treated becoming hard and desiccated. In pruritus of the perineal region great care must be taken to preserve perfect personal cleanliness. It is true that areas of lichenification on the free surfaces of the body are usually irritated by the application of water, but in those regions less irritation is caused by the necessary methods to ensure cleanliness than by the

regard it as being an end-stage which may result from a number of different forms of subacute inflammation. It may be preceded by a patch of eczematous dermatitis, by lichen planus or by psoriasis, and it may arise apparently spontaneously as *lichen simplex* (first pointed out by Vidal), which is the same condition as has also been called *neurodermatitis*. In any case when once established it is extraordinarily chronic and persistent. Diagnosis is easy enough, there is scarcely any other condition with which it can be confused, but treatment is far otherwise. There are two methods of attack which may be successful: one of these is the constant application of an occlusive dressing, the well-known Unna's paste being the most convenient, a method which is obviously impracticable in the case of pruritus ani, vulvæ or napex, but which I have seen give excellent results in patches on the shin or forearm; and the other is the use of some form of actinotherapy, either X-rays, radium or ultra-violet light.

Before I go on to a discussion of the application of these agencies, I must refer to certain cases of localized pruritus of the anus and genitalia, which show no apparent change in the skin of the affected regions. Such cases, I believe, affect only the regions of the anus or genitalia, and occasionally the shins. I do not think I have ever seen a case of localized pruritus of any other region without lichenification. It is, however, important in such cases to exclude the possibility of the irritation being due to some non-dermatological cause. For example, anal irritation in children is almost always due to threadworms, and in adults the possibility of hæmorrhoids, a fissure or fistula must always be borne in mind. According to Sabouraud a certain number of cases are due to a chronic streptococcal infection.

When, however, all these possibilities have been excluded there remain a certain number of apparently

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action of unremoved secretions.

As regards the surgical treatment of pruritus ani I preserve an open mind; I have seen cases which have failed to benefit from any of the radical operations which have been devised for its relief; but, on the other hand, of course, one does not see the cases which have proved successful. *A priori* I am prejudiced against it as it does not seem a reasonable procedure. But I would hesitate to dissuade a patient suffering from severe and intractable pruritus from submitting himself to operation. Those who are interested in the various surgical procedures devised should read the monograph on the subject by Montague, an American surgeon.

The whole subject of pruritus is a very difficult one, and there is plenty of room for research, both as to the mechanism of its production and as to its treatment. Is it possible that all irritation, except that caused mechanically by the presence of parasites, is due to the action of a single chemical substance, or of a single group of chemical substances liberated in the cutex? Sir Thomas Lewis's work suggests that a histamine-like body is at work in many instances, but no one as yet has demonstrated its presence. The first step in approaching the subject is to get a clear idea of what is meant by the terms we use, and in this article I hope I have been able to help practitioners better to understand the significance of the words prurigo, pruritus and lichenification.

The Relation of Ophthalmology with General Medicine.

By J. GRAY CLEGG, M.D., B.S., F.R.C.S.

Honorary Surgeon, Royal Eye Hospital, Manchester; late Lecturer on Ophthalmology, University of Manchester; President, Manchester Medical Society.

THOUGH the eye is but a small organ, only measuring 24 mm. in diameter, it fulfils a most important function as regards the well-being of the individual, and through it and its adnexa much is revealed with regard to the nature of disease both locally and with regard to the state, condition and functions of remote parts of the body. It is therefore necessary for an ophthalmologist to be thoroughly trained in general medicine and surgery, and his work cannot be usurped by opticians of the aggressive variety who desire State registration and therefore recognition by the public as diagnosticians of ophthalmic diseases and the general disorders revealed by an examination of the eye.

In my opinion, all inflammatory affections of the uveal tract are due either to the direct action of micro-organisms or to toxins which are produced in various parts of the body. One of the commonest is an iritis, and to be successful in its treatment a complete investigation is necessary to ascertain its true causation, and here the physician and bacteriologist are concerned. Syphilis, gonorrhœa and septic absorption are the common conditions responsible. The septic focus may reside in any part of the body, and a complete general examination is necessary, for it may be pyorrhœa, septic crypts in the

tonsils, or suppuration of the gall bladder, ingrowing toenail, genital conditions (especially in the female), or intestinal putrefaction. The same remarks apply to that other clinical entity called iridocyclitis or anterior uveitis. The recognition of this condition is not always of the easiest to the practitioner, but if he has a good lamp, a fair-sized ophthalmoscopic lens with a focal length of 3 inches and a small loupe, he will recognize readily the deposits which are found on the posterior surface of the cornea in practically all cases where the ciliary body is involved, as well as the early signs of *synechiæ posteriores*, i.e. adhesions of the iris to the anterior capsule of the crystalline lens from the inflammation of the iris itself.

The same careful general investigation is required in cases of choroiditis, the causes being similar. Senile cataract is thought by some to be produced by intestinal toxins and, if this theory is found to be true, the incidence of ordinary cataract will greatly diminish by appropriate cleansing of the digestive tract.

I do not propose to deal with the neurology of the eye, the anomalies of which yield most valuable information in cases of affections of the brain and spinal cord, but I intend to confine myself in the rest of this article chiefly to changes in the retina concerned with affections of the circulatory system.

HÆMORRHAGES.

The retina is nourished by the central artery of the retina, the branches of which are distributed in the inner layers and provide nutriment for them, whereas the deeper layers of the retina are chiefly nourished by the choroidal vessels. In the retina one meets very commonly with hæmorrhages. Some are the result of diapedesis, some of definite extravasation. They are due to many and diverse causes; they vary in size, position and depth. They are almost always most

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extensive at the posterior pole and to the temporal rather than the nasal side. Hæmorrhages may penetrate to any level. The most internal are usually fairly large with a convex lower border and a horizontal upper. Such are situated between the nerve fibre layer and the internal limiting membrane. They are designated as subhyaloid. Hæmorrhages in the nerve fibre layer are flame-shaped, lying between the nerve fibres, the distribution of which is roughly by radiation from the optic disc. Hæmorrhages into the deeper layers of the retina are usually rounded. The colour of such hæmorrhages is red, but where there are extensive extravasations a portion of the hæmorrhage may have a slaty colour; or, if the hæmorrhage is becoming absorbed, there is a mottling of red and white. Hæmorrhage may take place into the nerve sheath which is continuous with the dura mater—in fact, the subarachnoid space in the nerve sheath is directly continuous with the subarachnoid space in the brain. In cases of fracture of the skull, sometimes the blood in the anterior cranial fossa passes along and balloons out the dural sheath of the optic nerve. A similar condition appears where there is a ruptured aneurism of the anterior cerebral artery or there is a spontaneous meningeal hæmorrhage. Such a condition may occasionally be associated with retinal hæmorrhages. Dupuy-Dutemps gives the following as indications: Congestion of the disc and œdema, dilatation of the veins; retinal hæmorrhages are variable in number and extent. Vitreous hæmorrhages are rare, and these he attributes to obstruction of the flow in the retinal vein where it traverses the subarachnoid space, but he considers that as a cause of sudden blindness this condition has never been verified.

ARTERIO-SCLEROSIS.

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case of renal retinitis, due to a toxin, and even in the later stage, the bright white spots of exudate are not usually greater in diameter than that of a normal vein. They are sharp-edged and roughly circular. Very occasionally a star of exudate is formed at the macula, or a partial star or fan half-way between the fovea and the disc. The exudates change very slowly, but may even disappear without a trace. At a later stage of general arterio-sclerosis, the blood-pressure may rise and even a cloud of albumen appear in the urine. Their appearance adds to the gravity of the case, for when the blood-pressure is high, cerebral lesions are more frequent, and mortality greater. This retinal vascular change occurred in 45 per cent. of thirty-one cases, in one eye only, although one would expect that it would be bilateral. The spots are situated in the outer molecular layer. They are made up of hyaline-looking material staining pink with eosin and hæmatoxylin, and are deeply stained by orcein. Later, the effects are the production of white cords representing the artery, called "silver-wire arteries," and in some cases a pipe-stem appearance, i.e. a white sheath for only a short length of a vessel.

From the anatomical and embryological relations it would not be surprising to find that the state of the retinal arteries is a guide to the condition of the cerebral arteries. Out of sixty-six patients at the Royal London Ophthalmic Hospital, fifty-two were traced seven years later, and of these thirty-eight were dead, and in thirty-seven the cause of death was discovered. Seventeen had cerebral hæmorrhage or thrombosis, and six had hemiplegia or monoplegia. Therefore, out of fifty-two patients, twenty-three, i.e. 44 per cent., in seven years developed vascular disease of the brain, and in seventeen of these with fatal result. Adams, of Oxford, from his own observations, gave the percentage as forty-five. The relation of the retinal vascula

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their share in the majority of cases and therefore not infrequently the ophthalmologist first diagnoses the general condition. He has the distinct advantage of being able to see the vascular changes with the magnification of fifteen times by the direct method with his ophthalmoscope. It is important to have an electric ophthalmoscope. The pupil can safely be dilated with an ophthalmic tabloid of euphthalmin or one drop of a 10 per cent. solution of the same drug. Now, in retinal arterio-sclerosis, the first change is an increase in the brightness of the reflex from the retinal arteries which have been described as "copper-wire arteries." This is due to thickening of the middle coat, and the appearance is chiefly of value in vessels of the second and third bifurcations from the optic disc, and is of special significance if the central light streak has a beaded appearance. Normally, where an artery crosses a vein, the artery may hide the vein from view; but if the coats of the artery become thickened, the vein is obscured even for some distance each side of the blood column in the artery. The thickened artery interferes with the normal course of the vein, and the same applies where a vein is superficial to an artery. If there is distinct bending or kinking of the vein, sclerosis is of high degree. Such appearances may persist even for a few years, but progress may be noted in a few months' time. The vessels exhibit tortuosity, but as there is great normal variation in this respect the sign is not very reliable. Irregularity of lumen is observable. Retinal hæmorrhages occur, but they are usually small and flame-shaped, and only occasionally deeper seated and rounded in appearance.

When arterio-sclerosis of the retina has persisted for some time there may be superadded a distinct inflammation, and this is evidenced by the formation of exudates in the retina. The inflammation is the result of the local retinal vascular disease, and not, as in the

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internal carotid or ophthalmic artery.

ERYTHEMIA OR VAQUEZ'S DISEASE.

This is believed to be due to an affection of the bone-marrow. The abnormalities of sight are numerous and varied, but often indefinite. The veins both of the conjunctiva and of the retina may be greatly engorged. The usual symptoms are flashes of light, photophobia, mistiness, whirling sensations, scotomata, and, occasionally, hæmianopsia and diplopia. In my own case, none of the signs were marked, but there had been a preceding iritis.

LEUKÆMIA.

Out of twenty-five cases observed by Foster Moore, twenty of which were myelogenic and five of the lymphocytic type, only three were found to have any fundal change. Early signs consist of engorgement of the retinal veins and almost always of the arteries also. The blood in the vessels appears to be pale in both. Hæmorrhages vary much, and sometimes are of a diamond shape with a pale centre. Occasionally, according to Sorger, there are spontaneous hæmorrhages from the iris and ciliary body. In the later stages there occurs a general leukocytic infiltration. In chloroma, which some regard as a leukæmia with secondary malignant tumours, there are also hæmorrhages. In the fast-disappearing disease named chlorosis, of which, in my early days, I remember seeing cases, retinal hæmorrhages occur as also in purpura. Secondary anæmia from loss of blood of the traumatic variety does not seem to affect the retina, but it is remarkable that on bleeding from the intestinal tract or uterus, temporary or permanent loss of sight may result. Patients are almost always over 40 years of age. One or both eyes may be affected. If the fundus is seen in the early stages there is slight œdema of the

condition to that of the brain was looked at from another point of view. Forty-four cases of thrombosis or hæmorrhage were examined by Foster Moore. Thirteen, i.e. 30 per cent., showed no evidence of retinal arterio-sclerosis. In twelve, i.e. 27 per cent., it was present in mild or moderate degree. In 19, i.e. 43 per cent., it was severe, including arterio-sclerotic retinitis. It is remarkable that in atheroma of the aorta and great vessels, the retina is rarely affected. The general prognosis, Adams says, is dependent on the secondary renal and cardiac changes and is made worse if albumuria appears, but the more elderly patients withstand the presence of albumen in the urine better. As to sex, it is more common in women, and in them high blood-pressure is tolerated better than in men. In one female case the blood pressure was 300 mm. on three successive occasions, at intervals of a month, and the patient lived for four and one-third years.

Amaurosis fugax may be due to spasm of arteries in the retina. This has actually been seen, but it does not follow that the pressure in the retinal arteries is necessarily high, even when a sphygmomanometer registers as much as 250 mm. Where spasm of the arteries occurs, if circulation is restored soon vision returns, but if stoppage is prolonged the retinal power does not recover. In several cases the blood coagulates in the artery, and thrombosis results, which was formerly often regarded as an embolism. When circulation is entirely cut off coagulation necrosis of the retina sets in and produces the characteristic appearance of a cherry-red spot at the macula surrounded by a broad zone of white. This has been observed by de Schweinitz within ten minutes of the block. After an interval of seven days or more the retina clears up and becomes again transparent. Later a completely atrophic disc is found. In some cases optic atrophy may be produced by pressure on the optic nerve itself by a sclerosed

arterio-sclerotic cases, and those in which detachment of the retina had taken place, are excluded from the above figures. Miles Miley found retinitis in 52 out of 166, and Herringham, in patients under the age of 40, found 26 out of 46. The incidence varies in different forms of nephritis. In acute inflammation of the kidneys it is not common; in fact, the presence of retinitis means that the nephritis is of old-standing. In 119 cases of trench nephritis, which was always acute, only 5 showed retinal change. Of course, there is the difficulty of distinguishing cases of primary acute nephritis from an exacerbation of a previous existing chronic. In chronic parenchymatous nephritis, the retina is not usually affected. Nettleship found only seven out of fifty in patients under 21 years of age, and Foster Moore, seven out of twenty-three fatal cases. In chronic interstitial nephritis, Foster Moore found quite half of the patients suffered from retinitis, and Nettleship, in eighty patients under 21, found thirty-one had retinitis or marked retinal hæmorrhages. When uræmia supervenes, nineteen out of twenty show retinal changes. In adult males nephritis is twice as common as in women, but under 13 Nettleship found the reverse to be the case, i.e. more females as 2 to 1. As to age, the youngest recorded case was one by Bull in a girl aged 5. Moore noted it in a child aged 7, and in another child of the same age it occurred in whom the blood-pressure was 240 mm.

Blood-pressure in the development of retinitis.—Foster Moore noted that in twenty-three cases of retinitis the average blood-pressure was 211 mm., and in only six was it less than 200. In forty-five cases without retinitis the average blood-pressure was 150, and in only nine had it exceeded 160. It follows that it is not usual to meet with retinitis unless the blood-pressure is high.

Prognosis.—In regard to the prognosis as to life,

disc and surrounding retina, perhaps a few hæmorrhages, and later complete atrophy. One or both eyes may be affected. In half the cases, blindness of one or other eye is permanent, and the eye complication is not related to the quantity of blood lost. Retinal hæmorrhages are not uncommonly found in the newly born, but it is not customary to examine infants ophthalmoscopically.

THROMBOSIS OF THE RETINAL VEINS.

When this occurs there is a rapid loss of sight, not sudden, as in embolism or thrombosis. Both sexes are equally liable and the average age is about 60. The immediate cause is angio-sclerosis of the trunk of the ophthalmic vein at or near the lamina cribrosa, but it may occur in a branch, and then the exciting cause is pressure by an artery on a diseased vein. The blood-pressure is usually rather high, 160 to 180, and there is almost always some albumen in the urine. The veins are seen to be markedly engorged and there are very numerous hæmorrhages, chiefly in the nerve fibre layer. These may become absorbed entirely, but not necessarily does it follow that the sight is better afterwards. The fields show some irregularity, but very frequently there is a central or paracentral scotoma, as in a lady patient of mine aged 70. It was absent in one aged 83, a male. Acute glaucoma not infrequently follows within the next two months. Sometimes an attempt at collateral circulation is set up. The prognosis as to life depends on the general condition of the patient.

RENAL RETINITIS.

The appearances of this condition are characteristic, but not actually pathognomonic. In 102 cases of renal disease, Foster Moore found 34 had retinitis. These were all cases of chronic nephritis admitted to hospital, and acute nephritis, pregnancy nephritis,

posterior pole. They are usually flame-shaped, but may eventually all disappear by absorption. Exudates are of various types. Cotton-wool patches can be seen chiefly where the toxic element in the nephritis is prominent. In later stages fat is even formed in the same. Patches may become absorbed. In one case, slight infiltration was observed to disappear in a fortnight, but the denser areas last for months.

Vascular changes.—Veins show nothing definite, but in the later stages arteries become sclerosed. Most writers attribute the inflammation in the vascular coats to toxins.

Star figure at the macula.—This is sometimes preceded by fine whitish lines radiating from the fovea centralis. These are thought really to be lines of tension. A fully-developed star may form in as short a period as twelve weeks. Even this very defined exudate may disappear and leave no trace. One was observed to do so in nine months. It is more often seen in renal retinitis, but it is not pathognomonic, for it is found in common with papillœdema of cerebral tumours, embolus of the retinal artery, syphilitic retinitis, and thrombosis of the retinal vein. The central vision is not lowered unless the actual fovea centralis is affected. Usually there is no visible exudate at the fovea. It is probably hyaline in nature, for fibrinous exudates tend to be more diffuse.

Papillœdema.—There is usually some œdema of the optic disc, but occasionally it is marked and may be the only fundal sign. I have noted, not infrequently, œdema of the retina at the posterior pole as well. Later, exudates almost always appear which reveal the real causation. Curiously enough, papillœdema may affect one eye only. There is difficulty in differential diagnosis in such circumstances, in that vomiting and headache occur in renal disease and in cerebral tumour, and further, in cerebral tumour a

if pregnancy, arterio-sclerotic, and trench cases are excluded, two years is about the limit. Belt found that out of 419, 6 per cent. only lived longer than two years, and 65 did not survive more than twelve months. The prognosis is as grave in adolescents as in adults. Very exceptionally life is prolonged even up to 7 years.

The retinitis found in pregnancy is less grave in prognosis as regards life and recovery of sight, and statistics seem to show that life may be prolonged up to 9 years or longer. It is remarkable that it does not usually occur in a later pregnancy, nor does it often show itself in the earliest ones. Semple states that the retinitis in kidney and liver conditions is due to a common toxæmia, and, in support of this view, Posey and Hirst have reported a case with constitutional symptoms, but with normal urine, which developed very extensive renal retinitis with rapid recovery of vision when abortion was brought about. The retinal changes are usually severe with copious exudates, marked œdema, and even detachment. Sometimes loss of sight occurs without a retinal lesion. Adam found visual disturbances in 50 per cent. of cases of eclampsia, and the loss of sight may be rapid and complete. Stephenson and Herringham show that these symptoms are not dependent upon uræmia, they are usually associated with scanty urine containing albumen, blood and casts, and with general œdema and headache. Garrod and Thursfield suggest the immediate causation is an exhaustion of the cerebral visual centres.

Returning to renal nephritis in general, the ophthalmic changes are exudates, hæmorrhages, and œdema, but there is no constancy in the order of appearance. Œdema itself is not easily definitely seen by the ophthalmoscope, but the microscope reveals it even to passing through the external limiting membrane and collecting in the sub-retinal space and producing a detachment. Hæmorrhages are always present and chiefly at the

not found, and the blood-pressure does not rise. Various eye diseases have been attributed to gout, but I think it doubtful whether that diathesis ever affects the eyes beyond a rare case of conjunctivitis.

Now and again cases of amaurosis of uræmic origin may be ambulant, and the toxin is believed to affect only the cortex, the pupillary reflex being normal, showing that the basal ganglia are not implicated.

DIABETES.

Diabetes produces many interesting ocular conditions. It has been doubted, however, if a retinitis due to diabetes alone ever occurs, as it is not found in young subjects, and consequently it is unusual to find changes in the retina in a patient who has not some definite rise of blood-pressure. For all that, there are special features noted in the retina which are decidedly suggestive of diabetes. Foster Moore classifies them as follows:—

(1) Patches of retinal exudates in diabetes tend to have a sharply-cut edge and are often soapy and waxy looking. They are irregularly distributed, and sometimes form an irregular ring well wide of the macula.

(2) The star figure is uncommon, but if present it is not so regular.

(3) Soft-edged cotton-wool patches do not appear, and retinal œdema is never marked nor does detachment occur.

(4) Hæmorrhages are usually rounder because they occur in the deeper layers.

(5) The retinal pigment spots, which are not rare in the late stages of renal retinitis, are not seen in diabetes.

In many cases there is no albumen and no rise of blood-pressure, and therefore it is difficult to resist the conclusion that the retinitis is of truly diabetic origin. The prognosis for life is less grave than in renal cases; a patient may live as long as eight years after discovery

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partial star or fan may occur. The height of blood-pressure is of distinct use in the diagnosis. In pituitary tumour one may get papilloedema on one side, with atrophy of the optic nerve on the other; this is so where the tumour obliterates the connection of the subarachnoid space of the brain with that of the optic nerve sheath.

Retinal detachment.—This condition is most common where the retinal changes are most marked, and this is the reason probably that it is more often seen in pregnancy cases; many of the patients have anasarca. Foster Moore believes that detachment is due to local changes in the retina, and is not an expression of the general oedema. Reattachment may take place, and is more likely to do so than in the cases of ordinary detachment, apart from nephritis. The patient complains of subjective symptoms, such as flower or butterfly phosphemes, or all objects may appear coloured blue. Progression and retrogression of the oedema are more rapid in young subjects.

The first sign of a return to the normal is a restoration of the usual calibre of veins, but both they and the arteries may even become smaller than normal. The optic disc gets less swollen and appearance of secondary optic atrophy sets in. In a late stage cholesterin may be formed in some of the more solid exudates, and there are irregular pigmentary changes scattered about the fundus.

It is believed that there are two outstanding factors producing different types of renal retinitis, i.e. toxic and vascular, and that in parenchymatous nephritis the toxic element prevails, whereas in arterio-sclerotic kidney, the vascular is the dominant factor. In no inconsiderable number the type of kidney disease can be determined by the fundal condition. Recurrence of retinitis is not often observed.

In lardaceous disease of the kidney, eye changes are

not found, and the blood-pressure does not rise. Various eye diseases have been attributed to gout, but I think it doubtful whether that diathesis ever affects the eyes beyond a rare case of conjunctivitis.

Now and again cases of amaurosis of uræmic origin may be ambulant, and the toxin is believed to affect only the cortex, the pupillary reflex being normal, showing that the basal ganglia are not implicated.

DIABETES.

Diabetes produces many interesting ocular conditions. It has been doubted, however, if a retinitis due to diabetes alone ever occurs, as it is not found in young subjects, and consequently it is unusual to find changes in the retina in a patient who has not some definite rise of blood-pressure. For all that, there are special features noted in the retina which are decidedly suggestive of diabetes. Foster Moore classifies them as follows:—

(1) Patches of retinal exudates in diabetes tend to have a sharply-cut edge and are often soapy and waxy looking. They are irregularly distributed, and sometimes form an irregular ring well wide of the macula.

(2) The star figure is uncommon, but if present it is not so regular.

(3) Soft-edged cotton-wool patches do not appear, and retinal œdema is never marked nor does detachment occur.

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of the retinitis. Diabetics are liable to retinal hæmorrhages apart from retinitis. Hæmorrhages do occur, but of the subhyaloid variety, and even into the vitreous. Its age-limit contrasts with renal retinitis, it affects older persons only. Pervverted metabolism, diacetic acid, acetone more than excess of sugar in the blood are responsible, for it does not occur in young subjects.

Other eye conditions occur in diabetes. There is a special liability to iritis, and it is asserted by Harrison Butler that he has made a diagnosis of diabetes by observations with the slit-lamp in which he found œdema of the mamelons, the brown little knobs seen at the pupillary margin which are really the extreme limit of the pars iridis retinæ, but with the ordinary microscope there are almost always changes in the posterior epithelium layers of the iris.

Insufficiency of accommodation is observed, i.e. paresis of the ciliary muscle, but probably this is only related to the general debility. Diabetes also affects the lens and produces marked alterations in the refractive index; in fact, when one comes across patients with rapid increase of myopia one should always think of diabetes. The change may amount to as much as 7 dioptries. In addition, the lens fibres become opaque and cataract develops, especially in young subjects. The effect begins in the posterior layers, which come to have a homogeneous texture, the actual lesion is bilateral, and is only found in marked cases of diabetes. Diabetics in late life are subject to cataract, but the opacities cannot be distinguished from those of the ordinary senile type. Operation is not so satisfactory, and expression of the lens is often accompanied by loss of epithelial pigment of the iris, and the eye is subject to a post-operative inflammation of the iris tissue. It is therefore important, before operating for cataract on the diabetic, if possible to get the urine

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sugar free, but if that cannot be effected, it is well to get rid of the acetone and diacetic acid. The risk of post-operative inflammation is then slight, and coma, which would be fatal, is averted. I have had no case of post-operative coma for some years.

Another effect of this disease on the eye is the development of what is described as retrobulbar neuritis, which, however, cannot be well distinguished from toxic amblyopia produced by tobacco. The first onset is a lowering of the central visual acuity with a central scotoma for colours and eventually for white. It is advisable in all such cases, even if sugar is present, to prohibit the use of tobacco entirely. It is now believed that the excess of tobacco is toxic for the ganglion cells at the macula and does not produce a true retrobulbar neuritis, and it is possible that the effect therefore of diabetes is of the same nature and is limited to the same region, for undoubtedly the manifestations, i.e. shape and position of the scotoma, are indistinguishable. In diabetes, hypotony of the globe occurs in a few cases owing to some effect on the balance of secretions of the intra-ocular fluids by the ciliary body and the exit of the same via the canal of Schlemm. Another intra-ocular effect of diabetes is that of lipæmia retinalis. This is evident when the fat in the blood reaches any considerable quantity, which may, according to Thorner, even amount to 26 per cent. It occurs only in young subjects, and the changes are entirely confined to the retinal vessels. In fully-developed cases they appear to be filled with milk; death almost invariably soon occurs. Diabetes may also be responsible for paresis or paralysis of extrinsic ocular muscles.

It is at present difficult to assess the value of insulin therapy in the prevention of intra-ocular manifestations of this disease, but I find it of great value in pre-operative treatment.

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measles diplococcus serum. Eight children received concentrated horse serum, and none developed the disease. Twenty-seven infants and children were given goat serum, twenty-three of whom did not develop the disease, while three had mild attacks of measles, 18, 19, and 22 days respectively after exposure. One infant received the injection supposedly on the fifth day after exposure, and measles developed on the second day following; in this case the serum was given too late for protection. Two exposed infants, aged 9 and 11 months, who were not given serum, developed measles. Therefore, there was complete protection from measles in thirty-one out of thirty-four patients inoculated in this series of cases.—(*American Journal of Diseases of Children*, July, 1928, p. 123.)

The Relief of Visceral Pain by Subcutaneous Injections of a Local Anæsthetic.

M. Roch has confirmed the results obtained by Dr. Lemaire, of Louvain, in relieving the pain caused, for example, by an inflammatory process in an abdominal organ, by subcutaneous injections of novocaine, 10 c.cm. of a 1 per cent. solution being employed. Dr. Roch achieved success in relieving pain in 80 per cent. of the cases in which it was employed, such as gall-stone colic, renal colic, appendicitis, pleurisy; it was of no avail, however, in tabetic pains, in neuralgia caused by cerebellar tumour, nor in acute rheumatism of the knee. The method must be employed prudently, for the patient may consider that the relief of the pain, as in appendicitis, means the cure of the condition, which is not at all the case.—(*Revue Médicale de la Suisse Romande*, July 25, 1928, p. 650.)

Changes in the Hair following Vasoligation.

H. Benjamin notes that a very conspicuous and by no means infrequent symptom appearing after the "Steinach operation" of ligation of the vas deferens is the change in the growth and colour of hair. This has been observed in senile animals in whom the fur shows signs of old age, vasoligation producing in the majority of cases a renewed growth of hair and improvement in the appearance of the fur. This influence on growth and pigmentation of hair has likewise been observed in men, in a certain percentage of those cases that have responded to the vasoligation. Dr. Benjamin gives many references to medical literature confirming this improvement in the hair, and reports in detail, with photographs, a case of his own, in which the improvement has lasted for over four years.—(*New York State Journal of Medicine*, July 15, 1928, p. 862.)

The Treatment of Lupus of the Nose, Pharynx, Mouth and Larynx.

Sir St. Clair Thomson states that his treatment of lupus of the nose, pharynx, mouth and larynx consists of sanatorium principles and the galvano-cantery. He insists that in lupus the galvano-

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The Diagnosis of Drunkenness.

E. Bogen insists, in view of the difficulty in making the diagnosis of acute alcoholic intoxication from the clinical evidence alone, and in view of the constancy of the findings as to the relationship of the concentration of alcohol in the urine and breath to the degree of alcoholic intoxication of the patient, that the examination of persons to determine the state of alcoholic intoxication should in every instance include some such quantitative estimation of the amount of alcohol present in the urine, breath, or body fluids. Dr. Bogen estimated the concentration of alcohol in the spinal fluid in twenty instances, and found it to be very close to that of the urine. In sixteen of these cases it was more than 3 mg. per cubic centimetre; increased pressure of the spinal fluid was usually found in these cases, and the patients often roused up considerably and sometimes completely following the lumbar puncture.—(*American Journal of the Medical Sciences*, August, 1928, p. 153.)

The Treatment of Malignant Cerebral Tumours.

J. Lhermitte suggests that the proper surgical treatment of a malignant cerebral tumour is the complete excision of the cerebral hemisphere affected, on account of the impossibility of being certain of the limits of such a tumour. As, however, the left cerebral hemisphere contains the intellectual centres, only the right hemisphere can be removed with prospect of the patient's survival. Removal of the right hemisphere brings about left hemiplegia to a greater or lesser degree, but as patients with a malignant tumour of the right hemisphere already have such a hemiplegia, this does not contraindicate the operation. This somewhat alarmingly radical surgical operation has been carried out by Dr. Dandy, of Baltimore, in five cases, one of whom died in 48 hours, one in two weeks, from pneumonia, and one in three months, from a recurrence of the growth; one patient lived for three and a-half years and then died from a recurrence, and one patient is still alive and apparently cured.—(*L'Encéphale*, April, 1928, p. 314.)

The Prevention of Measles.

M. G. Peterman discusses the prevention of measles, giving a very full bibliography of the literature on the subject. Dr. Peterman records an outbreak of measles in the infants' ward of the Milwaukee Children's Hospital in June, 1927. Through the courtesy of Dr. Tunnicliff (who prepared the serum), antimeasles diplococcus, goat and horse serum, was used. Thirty-five exposed infants and children with no history of previous measles were given the anti-

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and the easy propagation by peritoneal implantation make surgical cases difficult. At the Mayo Clinic, 59 patients with ovarian carcinoma were treated by irradiation from January, 1920, to January, 1924. In the majority of cases radium packs in the vagina were combined with X-ray applications, so as to cross-fire the abdomen through four anterior and posterior fields; in several cases, subsequent courses of X-rays were given at intervals of one or two months. In seven cases of unilateral tumour of the carcinomatous cystadenomatous type, repeated courses of moderate-voltage X-rays alone were used. Of the total number of cases, 18 survived for from four to seven years, 17 being alive at present, which compare very favourably with the available reports of the results of surgical procedures alone. Repeated moderate irradiation has given results superior to those of more intensive irradiation.—(*American Journal of Obstetrics and Gynecology*, July, 1928, p. 1.)

The Treatment of Cancer of the Uterus.

G. G. Ward and L. K. P. Farrar come to the conclusion that the statistics today show that in irradiation of early carcinoma of the cervix uteri there are just as good results to be obtained as in the radical operation, with less primary mortality and less morbidity. In two five-year series (up to May, 1923) of cases of carcinoma of the cervix treated by radium therapy, the authors' percentage of cures in all cases was 24·6 per cent., and in the early cases, limited to the cervix, it was 56·7 per cent. In their opinion repeated irradiation, when needed, checks the extension of carcinoma, and a daily douche and care of the general health are necessary adjuncts for a cure. The lacerations of childbirth should be repaired immediately or soon after confinement, as a method of lessening the incidence of carcinoma of the cervix uteri.—(*Journal of the American Medical Association*, August 4, 1928, p. 296.)

The Treatment of Thrush.

J. Basch recommends neosalvarsan as a specific remedy for the ulcerative stomatitis of thrush in children. The contents of a 0·15 gram ampoule of neosalvarsan are painted on the ulcerated surfaces by means of a pledget of cotton-wool. In the diffuse form and in the early stages of the acute disease the whole mouth cavity may be painted in an attempt to prevent further spread. Only in the diffuse form should it be necessary to repeat the painting, though if satisfactory progress is not apparent after five days this may be done with a dose of 0·3 gram.—(*Deutsche Medizinische Wochenschrift*, July 20, 1928, p. 1206.)

The Prevention of Naso-Pharyngeal Epidemics in Schools.

J. A. Glover is of opinion that over 80 per cent. of school sickness, whether judged by the number of cases or by the time lost, is transmitted by "droplet" infection. The bulk of these infections are accounted for by: (1) influenza; (2) feverish cold; (3) tonsillitis;

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cautery has never failed him; it acts with certainty; used correctly it is free from risk or danger; and, compared with various forms of radiation, it is exempt from possible, uncertain and sometimes remote, evil effects.—(*Journal of Laryngology and Otology*, August, 1928, p. 537.)

Radiography of the Cerebral Arteries.

E. Moniz publishes a description of his improved method of obtaining radiograms of the arterial network of the brain. The common carotid artery is exposed by a small horizontal incision and clamped temporarily about half an inch below the carotid sinus. The external carotid is then clamped and the needle of a syringe is introduced into it, a little blood being drawn up to make sure it is actually in the artery; 4 to 5 c.cm. of a 25 per cent. solution of sodium iodide is then injected and the X-ray examination of the cerebral arteries made at once. The clamps are then removed. A number of excellent radiograms are reproduced in the article.—(*La Presse Médicale*, June 2, 1928, p. 689.)

The Treatment of Fractures in Children.

M. Mouchet discusses the treatment of fractures in children, and, although he had employed the method for some years, he has come to the conclusion that massage is of no advantage in these cases. On the contrary, he is of opinion that massage may be an exciting cause of exuberant callus or of muscular osteomata, and therefore may be a decided disadvantage instead of an advantage in fractures in children.—(*Gazette des Hôpitaux*, August 11, 1928, p. 1152.)

The Treatment of Derangements of the Knee-Joint.

M. Harbin observes that in the minds not only of the laity, but of too great a number of practitioners, there is the misconception that limitation of motion or stiffness frequently follows operations of any type upon the knee-joint. Dr. Harbin emphasizes the importance of early surgical correction of complete lacerations of the internal lateral ligament and capsular tears of the knee-joint in preference to fixation and apparatus alone. Late repair is rarely satisfactory as the immediate approximation of the torn structures, and, further, it is the impression that these patients so treated suffer a shorter period of disability. The removal of loose bodies from the knee-joint results in complete return of function; and in cases with villous arthritis and hydrops synovectomy of the knee-joint has brought about excellent results.—(*Surgery, Gynecology and Obstetrics*, August, 1928, p. 155.)

The Treatment of Cancer of the Ovary by Irradiation.

F. A. Ford points out that the rapid growth of ovarian carcinoma, the marked tendency to metastasis through the profusion of blood and lymph channels, the facility to spread to neighbouring organs,

PRACTICAL NOTES

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regular infectious diseases make a comparatively small showing. As regards prevention, the efficacy of vaccines is uncertain; if given, they should be administered before the danger period, i.e. not later than November. Intensive prophylaxis other than vaccines during the first half of the Lent school term amply repays the trouble. It should include: (a) special efforts to prevent pupils returning to school after the Christmas holidays infected with influenza or febricula; (b) temperature-taking for three weeks; (c) immediate isolation of all pyrexias and catarrhs; (d) no work before breakfast for at least the first six weeks of the term; (e) all hot baths and showers taken during the day or after games to be followed by cold showers; (f) prevention of chill in watching games, etc.; (g) increased provision for drying clothes, uniforms and boots. Infection mainly takes place in sleeping quarters, and proper spacing out of beds and thorough "cross" ventilation in dormitories is of paramount importance.—(*Proceedings of the Royal Society of Medicine*, July, 1928, p. 1593.)

The Malaria Treatment of General Paralysis.

B. Dattner has treated 129 cases of general paralysis with malaria from four to six years ago. Of these cases 81 are still alive, and a recent examination of their cerebrospinal fluid shows that in 36 the Wassermann reaction was negative, in 27 it was slightly positive, and in 7 it was definitely positive. Fifty-seven of the patients showed no clinical symptoms of the disease, in 15 the clinical condition was stationary, and in 8 it was getting worse; but of the patients whose cerebrospinal reaction was negative, none had clinical symptoms of disease. Dr. Dattner had come to the conclusion that after-treatment with neosalvarsan was of undoubted benefit.—(*Klinische Wochenschrift*, May 13, 1928, p. 921.)

The Present Status of Ovarian Therapy.

E. Novak observes that, both from a clinical and laboratory standpoint, the evidence indicates that the oral administration of ovarian, corpus luteum, and ovarian residue extracts has little or no value in the treatment of such objective disorder as amenorrhœa. In the treatment of the characteristic vasomotor symptoms of the menopause there is much evidence, though necessarily only clinical, that oral ovarian therapy is of value. While the hypodermic administration of the newer extracts is, on the basis of undisputed laboratory investigations, without doubt the method to be preferred, it possesses serious practical disadvantages which will almost certainly limit its applicability very materially. These disadvantages are enhanced for the present by the comparative scarcity of potent extracts and their rather considerable cost. As the ovarian follicle hormone at least possesses a slight effect when administered orally (not more than one-twentieth the hypodermic effect), it is not impossible that some form of satisfactory oral therapy may yet be developed, either by developing new sources of supply or by increasing the

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potency of the substance by some artificial means. Recent investigations, which demonstrate the profound effect produced on ovarian function by repeated implantations of anterior pituitary gland tissue, lead to the hope that future work along this line may yield some method of applying this new knowledge therapeutically.—(*Journal of the American Medical Association*, September 1, 1928, p. 607.)

The Treatment of Leprosy.

M. Bourgeois and D. Tsatsaronis recommend vaccine therapy in the treatment of leprosy and record a case successfully treated by a vaccine made from tubercle bacilli and lepra bacilli. The method employed was to give intramuscular injections of this vaccine twice a week, and after the eighth injection a marked reaction took place, the lepromas breaking down and discharging a serous fluid, while a rise in temperature occurred. After this reaction, injections were given once a week only, up to a total of twenty injections. At the end of three months cicatrization of the lepromas had taken place and bacteriological examination of the nose was negative for lepra bacilli.—(*Le Progrès Médical*, July 7, 1928, p. 1115.)

The Treatment of Malignant Tumours.

R. Minervini asserts that in the treatment of some cases of malignant tumours he has found that antimony salts, and especially antimony and potassium tartrate, have a beneficial effect. In some other cases, especially adenocarcinoma, he has found improvement follow the administration of emetine. In a number of cases he has administered the salts of antimony and potassium along with an extract of ipecacuanha with ensuing benefit. These statements must, however, be taken at present with reserve, until Dr. Minervini's conclusions have been confirmed by other workers.—(*La Riforma Medica*, May 21, 1928, p. 622.)

The Treatment of Aneurysms.

L. Plissom discusses at some length the various methods of treating aneurysms and comes to the following conclusions: (1) When one can absolutely do nothing else for the aneurysm, simple ligation either above the aneurysm or below it, followed by the injection of gelatinized serum, is a makeshift with which one must be content. (2) When careful clinical examination leads to the conclusion that ligation will not be followed by the phenomena of local anæmia, the method of choice is to ligate above and below the pouch and then extirpate it. (3) The reparative operation should be employed only in those cases where collateral circulation is not well provided for, a segment of vein being used as a graft between the ends of the artery; but the aneurysm must be small and the arterial walls healthy in such a case.—(*Le Progrès Médical*, August 11, 1928, p. 1321.)

Reviews of Books.

The Tonsils and Adenoids and Their Diseases. By IRWIN MOORE, M.B., C.M. Pp. 395, 107 illustrations. London: Wm. Heinemann (Medical Books), Ltd. 21s. net.

ON any question regarding tonsils and adenoids this exhaustive work by Dr. Irwin Moore must be regarded as the final authority for many a long day to come. Its excellence can perhaps best be gauged by comparing it with the two American books which already exist on the subject, both by leading authorities on the other side of the Atlantic; and, in comparison with Dr. Irwin Moore's exhibition of erudition and research in this monograph, both can fairly be said merely to toy with the subject. It is interesting to learn from the preface that the germ of this book lay in an article by the author published in *THE PRACTITIONER* in 1918. It may seem to some practitioners that a book of nearly four hundred pages on tonsils is carrying matters to the extreme; but they will find Dr. Moore's presentation of the subject easy to read and always interesting, and as a result of his work there should be less indiscriminate operating and more skilful work done. His discussion of the case for "London paste" as a substitute for operation, with which his name has been identified of recent years, is restrained and does not take any undue place in the book. There are several pages of references at the end of each chapter, and the index is the best we have encountered in a book of this size.

A Shorter Anatomy: With Practical Applications. By E. WOLFF, M.B., B.S., F.R.C.S. Pp. viii+451. London: H. K. Lewis & Co., Ltd. 18s. net.

THIS book is especially intended for those revising their anatomy for the final examinations, and the practical applications which follow directly on the anatomy under discussion are included throughout. Thus we find an account of bony landmarks, of the surface form of muscles and the methods of showing them up, and of landmarks of arteries and other structures of importance in surgical practice. Many practical points are introduced (in italic type) as well as radiograms of the principal bones and joints, showing ossification. The book is eminently practical and should be of considerable value to the senior student and to the practitioner. The illustrations, of which there are 130, are excellent and show just what is required.

A Text-Book of Surgical Diagnosis. Edited by A. J. WALTON, M.S., F.R.C.S., B.Sc., M.B. Pp. 1,121. 2 vols. London: Edward Arnold & Co. 63s. net.

THE difficulty of confining a work to one aspect of a large subject increases with the growing complexity of medicine and the interdependence of its branches, yet it is complexity that creates the

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necessity for restriction of aim in modern textbooks. Diagnosis, however, is impossible without a pathological foundation, and Mr. Walton has allowed his eminent contributors latitude in respect of surgical pathology. For example, Sir Lenthal Cheate's chapters on inflammation and the breast are full of morbid anatomy and histology. Other sections that call for special mention are those of Mr. Fairbank on deformities, authoritative yet simply told; of Drs. Riddoch and Brain, on the brain and skull, who in short space give a clear account of the signs that serve to localize cerebral tumours; of Mr. McDonald, who is to be congratulated on his urinary chapters; and of Mr. Walton himself whose sections on the stomach, duodenum, biliary apparatus and the pancreas display his judgment and wide experience. Mr. Norman Patterson's sections are marred by failure to give clear accounts of the symptomatology of the various pharyngeal growths. Mr. Platt has retained the older descriptions, now widely discarded, of epicritic and protopathic sensory loss following nerve division. The book is closely, but clearly, printed, illustrations are many and distributed through the text, and the radiograms are excellent. Not all the illustrations are useful, for though the subject is diagnosis, a contributor's enthusiasm is permitted to fill space with a portrait of a patient "After cure." We commend the work to the attention of the general practitioner, of the surgeon and of the student, as a noteworthy addition to the textbooks of today.

Orthopædic Surgery. By W. A. COCHRANE, M.B., CH.B., F.R.C.S.E.
Pp. 523. Edinburgh: E. and S. Livingstone. 21s. net.

THIS manual of orthopædic surgery is written mainly for students and it is based largely upon experience gained by the author in American clinics. There are roughly 500 pages, the first part, of 85 pages, dealing with bodily mechanics and posture. Owing to fewer illustrations, this early section occupies more of the narrative than the pages indicate. The section on posture is the first attempt in this country to incorporate, in a student's manual, teaching on the influence of posture and bodily mechanics on health and disease. Much has been done in America to spread this knowledge, particularly by Goldthwait, who has largely inspired the writer of this book. In presenting this teaching the author writes enthusiastically, but there is a tendency to exaggerate the importance of posture in its influence on disease, and it is extremely doubtful whether some of the statements contained in this section would be accepted by many surgeons in this country. The second part of the work deals with disabilities and deformities, and they are treated as they occur in the various joints and regions of the body. Disabilities of the lower back, lumbo-sacral and sacro-iliac regions are especially well described, most of this probably being new to practitioners unacquainted with American orthopædics. The sections on treatment are properly dealt with within the space permitted by a work of this size. The principles of orthopædic surgery are well described, and the practitioner should find this manual of great help; it has been well produced and profusely provided with good illustrations.

Preparations, Inventions, Etc.

PLASMONA.

(London: Plasmon, Ltd., 66A, Farringdon Street, E.C.4.)

Among recent advances in medicine perhaps the most important are the recognition of the close relationship between sunlight and the hitherto undiscovered vitamins, and the value of liver diet in pernicious anæmia. These facts have been realized by the manufacturers of Plasmon, the milk protein preparation that has been well known to the medical profession for the past thirty years, and the necessary substances have been incorporated, with others, in a new preparation which they have named Plasmona. In four ounces of Plasmona the content of vitamin-D is equal to that of 2,000 grams of cod-liver oil, so that a dose of one heaped teaspoonful (weighing about a quarter of an ounce) is equal to the anti-rachitic principle of 125 grams of cod-liver oil. Regarding liver extract, four ounces of Plasmona contain the equivalent of eight ounces of fresh liver; that is, one heaped teaspoonful three times a day, the amount indicated for an adult, is equal to a daily consumption of three ounces of fresh liver. Plasmona also contains lipoids (especially phosphatides, cerebroside, cephalin and protagon), the growth-promoting vitamin-A, the anti-neuritic vitamin-B and the reproductive vitamin-E, as well as other substances of high biological value. While it is true that "grape-shot" remedies are nowadays out of fashion in therapeutics, it seems to us that such a nutritional preparation as Plasmona ought to and must contain many different principles if it is to be of any real value to the complex organization of the body. We feel, therefore, that Plasmona can be recommended in cases of general debility and exhaustion, in convalescence, as a tonic to those engaged in strenuous work, to those of feeble appetite, and to undergrown children. Incidentally, it has an exceptionally pleasant flavour.

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Dr. T. T. B. Watson has prepared, with the help of various specialists, a series of printed slips on some matters about which practitioners frequently have to repeat themselves to patients, and in our opinion these slips are calculated to save much time and trouble. The series includes the following subjects: How to give hot fomentations; gonorrhœa; intensive alkaline treatment of gastric and duodenal ulcer; exercises for constipation; how to cleanse the eye; nasal douching, inhaling, gargling; diet in obesity; dental extractions' after-care. Other subjects are in preparation.

THE PRACTITIONER

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1928

Some Considerations in Relation to Functional Diseases of the Heart.

By SIR THOMAS J. HORDER, BART., K.C.V.O., M.D., F.R.C.P.

Physician-in-Ordinary to H.R.H. the Prince of Wales ; Physician to St. Bartholomew's Hospital ; Physician to Cancer Hospital, etc.

I WISH, in this article in THE PRACTITIONER, to discuss a problem which arises very frequently in the practice of all of us. It is this: How to assess aright the cardiac factor in our patients, from whatever disease process they may be suffering. A difficult problem very often, granted, yet one which is of great importance. A large problem, too, and therefore I shall perhaps be pardoned for not covering more than a part of the ground.

Let me state my main thesis at once. It is that in the great majority of cases we are dealing not with a disorder of the heart—still less with a disease of the heart—as distinct from the rest of the body, so much as with the cardiac reference, in the patient's consciousness and sense of efficiency, of his general state. If this thesis be borne out by experience, it is clear

Preparations, Inventions, Etc.

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and assume that early structural changes are present, because that policy may lead to the production of invalidism and an exaggeration of the heart consciousness where no structural disease exists, nor even a special tendency to this—a lamentable sequel to our efforts. Nor should we hastily enlarge the sphere of investigations specifically directed towards the heart, as by graphic methods. The proper interpretation of electrocardiographic tracings is not yet sufficiently advanced to give us exact criteria of structural as against functional disease and, if we decide to employ this method of examination, it is well to choose a colleague with large experience of human nature as well as of disease, or insist upon sharing in the verdict ourselves. It has been said of the older school of physicians that they often took unnecessarily gloomy views of their patients when the stethoscope discovered the presence of a cardiac bruit. This may be so. It is quite certain that the graphic school of cardiologists makes heart invalids in no small number, and those typewritten instructions which are "for the rest of your life" have oft-times the same effect upon the patient as the terrible words set over the portal of Dante's inferno.

Following this thesis I would say that it is not only sound pathology, it is also sound treatment, to shift the venue of the inquiry from the heart to the rest of the body, stressing the importance of every point we come across where there is defective functioning. We are not likely to be proved wrong by the course of events if, in the presence of such points, we take the view that a patient, whose heart reveals no signs of structural disease after a careful and critical examination, owes his heart consciousness primarily to extrinsic, and not to intrinsic, defects.

Let me now assume that such a thorough survey, including as it would, in appropriate cases, instru-

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that to conceive of the heart as the seat of the disorder, rather than as being a particularly sensitive recorder of symptoms, is not to look at the picture from the angle which tends to the greatest helpfulness to the patient.

An important psychological point is involved. In the mind of the patient and of his friends—in our minds, too, though in very different degree—lurks the idea that with heart trouble, of whatever kind, the danger to health and life is greater than in the case of trouble associated with any other organ. The full extent of this fear is the apprehension of sudden death. But the layman does not know, as we do, that heart consciousness may exist for many years and the organ still remain organically sound; nor does he know that the more conscious the patient is of his heart the less likely is such a disaster to happen. For the serious diseases of the heart are for the greater part silent as regards heart sensations, whereas innumerable ailments that are relatively minor in their significance are garrulous with the heart as mouthpiece. To give the heart-conscious patient this knowledge is itself at times of no small comfort and, if tactfully stated, is often a good preliminary to whatever advice we have to offer.

Another psychological point sometimes arises: the patient has a family history of "hearts," and he knows it. This often adds considerably to his fears. Since there is no doubt about the existence of familial heart disease, organic as well as functional, the situation calls for the utmost tact.

Since there is a thought in our minds which, perhaps fortunately, is not much, if at all, in his—that it is much less difficult to prevent structural disease of the heart than it is to cure it—we are no less desirous than is the patient to read the case correctly, though for a different reason. But we dare not merely "play for safety"

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Let me now assume that such a thorough survey, including as it would, in appropriate cases, instru-

mental investigation, reveals no certain evidence of organic disease. We are then faced with the problem which is the subject of this article: Of what symptoms do such patients complain?

The symptoms in functional heart affections may be grouped under the headings *palpitation*, *fainting*, *precordial discomfort*, *lassitude*, *giddiness*, *breathlessness* and *pain*. It is to be noted that these symptoms do not differ in nature from those present in many cases of structural heart disease. But their relative incidence is quite different. Thus, in proportion as palpitation is prominent in any case (as already hinted at) the probability of functional disease is high; if pain be the most marked symptom we are chary of diagnosing functional trouble only, since this symptom is known to occur in serious disorders of the myocardium with or without coronary disease. Fainting (syncope) is so often a sign of vasomotor disturbances that it is of little service in estimating the condition of the heart. A sense of lassitude is a symptom common to so many morbid states that it must be read in terms of myocardial insufficiency only with great caution. The same comment may be made with regard to giddiness. Precordial discomfort is doubtless of more consequence as a true heart symptom, and yet here, too, care must be exercised: I have known a very careful colleague admit that he had quite forgotten that the left inframammary region was one of Charcot's "hystero-genic zones."

It may be said of breathlessness that here, at least, is evidence of cardiac disease. I think that the vigilant observer is able to detect the breathlessness of structural heart disease almost unerringly. But there are pitfalls for the unwary. I should like to refer at this point to the fallacies that lurk in some of the tests applied to patients in estimating their heart efficiency: running upstairs, for example, or raising

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the fully-extended legs half a dozen times as the patient lies on the couch, and observing dyspnoea or counting the pulse-rate before and after these efforts. A little emphysema, a set of atonic muscles, a distended stomach—any one of these is enough to vitiate these tests. Moreover, any novel form of exercise is done with greater effort than one to which the patient is accustomed. It is seen, therefore, that great care must be taken in interpreting results during the investigation of the "effort syndrome": the state of the emotions, of the lungs, of the stomach, of the vasomotor system, all these must be considered. Emphasis must not be placed upon the presence of one or two of the symptoms constituting the syndrome; it is the combination of all the symptoms of the syndrome in the absence of defects elsewhere which signify cardiac insufficiency.

Let me now turn to a consideration of some of the actual types of functional heart troubles that we meet with:—

(1) *The Toxic Heart.*—This is one of those most frequently seen. The response to a toxæmia may be shown in several parts of the body, or it may be in the cardiac field alone. Certain microbic infections have a special tendency to induce cardiac disturbances, whether nervous or muscular, or both. Influenza is notoriously one of these. Trench fever, during and just after the war, was another. Streptococcal sub-infections are a third, and these are probably the most common of all. The doctrine of "focal sepsis" appears to be sound in the light of experience, both clinical and bacteriological, and has doubtless come to stay. The sources of streptococcal toxæmia leading to cardiac dysfunction, whether it be palpitation associated with extra-systoles or with tachycardia, or some less well-defined form of heart consciousness, are most often traceable to the alimentary tract; localized foci, such

as the teeth, the tonsils, the appendix and the gall-bladder ; or diffuse foci, such as the intestine and the stomach. Less common sources are the nasal sinuses. In the case of the teeth we have to consider "apical sepsis" as well as peri-odontitis proper. We have also to remember that pyorrhoea in the true sense of that word may be quite absent and yet a considerable degree of chronic sepsis be present. Good radiograms are essential to correct diagnosis in this connection.

The cardiac symptoms may precede any overt expression of the actual infective process, be the nature of this what it may.

I was recently asked to help in the treatment of a young woman whose sole trouble was persistent tachycardia. She was not a neurotic and there were no other signs of hyperthyroidism. A fortnight of close observation and investigation yielded no clue. I advised that the symptom should be neglected as far as possible and moderate exercise was encouraged. Nothing happened—except the persistence of the tachycardia—for 12 months. The patient then developed enlarged glands in the right anterior triangle of the neck, and these had the characters of a tuberculous adenitis. Winter approaching, she was sent to Switzerland for sun, air and rest, and was given hypophosphites and cod-liver oil. She lost both the enlarged glands and the tachycardia. Twelve months later I saw her again, on account of an extensive erythema nodosum, and with a return of both the enlarged glands and the tachycardia. I then learned, what had previously been concealed by the mother lest her daughter should hear of it, that two maternal aunts of the patient had died of pulmonary tuberculosis. I have little doubt that she was suffering from some active but cryptic tuberculous focus at the time she first came under observation.

(2) *The Post-Febrile Heart*.—Allied to the toxic heart is the post-febrile heart, which not seldom presents an important problem in children: How long shall the child be kept in bed? How long shall it be carried, or wheeled in a chair? Anxious mothers, and equally anxious nurses, report pulse irregularities, especially during sleep; but these are generally of the sinus arrhythmia type or, less often, due to extra systoles. In this group of cases it is useful to consider the nature of the fever: if it has been rheumatic or

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scarlet or diphtheria, we must exercise the greatest caution.

(3) *The Tobacco (and Tea) Heart*.—Unlike some, I have no doubt about the existence of cardiac dysfunction resulting from both of these toxic agents. A notable point is this: that in both, but especially in tobacco, pain may be present, and may be definitely anginoid in its features. Very occasionally the pain is accompanied by *angor animi*, and is then quite indistinguishable from the angina of coronary or myocardial disease.

(4) *The Hyperthyroidic Heart*.—In the fully developed picture of Graves' disease, or even in those cases in which one or more of the signs (other than tachycardia) is present, the diagnosis of the cause of the patient's palpitation is obvious. But it is important to bear in mind that very mild or early cases of the disease often go overlooked because the possibility of its existence is not in the observer's mind. Some practitioners are much more sensitive to the voice and behaviour of an early case of Graves' disease than are others, and can thereby detect the condition and so identify the source of the heart consciousness. In most of the patients there is a striking absence of any subjective—or objective—lack of cardiac efficiency.

(5) *The Pubescent Heart*.—This is a very definite clinical entity. It comes under observation more often in boys than in girls. The patients are prone to be tall and weedy, and to be growing fast. ("He seems to have overgrown his strength.") This type of boy is that seen frequently in postural albuminuria; indeed, both conditions may be present together. The most frequent symptoms are slackness, giddiness, breathlessness and fainting. There are objective fea-

tures as well as subjective: the facies is altered ("He gets so dark under the eyes"), pallor and flushing succeed each other rather rapidly, and the face changes, sometimes markedly, with the erect and the recumbent posture. Because of its dramatic associations, fainting (syncope) has more significance to the lay mind than it has to ours; and it is usually thought to be more serious when the patient is a boy than when she is a girl. To us, fainting has closer associations with vasomotor states than with cardiac conditions; and the liaison between the nervous system and the vasomotor mechanism being again very close, the knowledge of this fact prevents us from considering syncope to be a bad prognostic. The heart of a pubescent, growing lad may easily be misjudged in its signs. There are the signs of a relative hypertrophy—a sthenic and diffuse impulse, the first sound a little booming in character and lacking in clearness ("murmurish"), the second sound at the pulmonary base a little sharp. Sinus arrhythmia is common: a physiological affair. Too often the considered opinion of the school doctor is disregarded, games are barred, rules are imposed and the morale suffers. Unfortunate situations sometimes arise between the school doctor and the home medical adviser, or between the school doctor and the cardiologist. In the great majority of these cases subsequent happenings prove the school doctor to be correct in his judgment. Meantime the boy may have been removed from school on account of the supposed cardiac flaw and his career may have received a disastrous check.

(6) *The Heart at the Menopause.*—This reveals another type of epochal cardiac disturbance. A good deal of harm may be done here, such is the depressed state of many patients and so impressionable their minds during the climacteric, by any undue stressing of the particular

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symptoms that are referred to the heart. There are abundant materials for painting the picture of cardiac insufficiency; but, in fact, the condition is one of nerve-tone insufficiency rather than of insufficiency of any special organ. Vasomotor instability is prominent and hyperpiesis is very common. In not a few of the cases the rise in arterial tension is prone to be somewhat alarming. I have almost given up saying at what figures it is probable that we are dealing with structural changes in the arteries rather than with a purely functional state. The vasomotor part of the picture often dominates the purely cardiac reference, but it is none the less on account of her heart that the patient often comes for advice.

(7) *The Heart out of Training.*—Nothing is capable of introducing more fallacies into the interpretation of so-called “heart symptoms” than that they arise after some sudden effort for which he is quite unfit in a patient who is “soft” as the result of a sedentary life and who also “lives well.” The city man happening to be in this state, runs to catch a train. He succeeds, but the resulting bout of breathlessness so alarms him or his companion or his wife when she hears of it, that he is hurried off to a heart specialist forthwith. All now turns upon the wisdom, rather than upon the knowledge, of the cardiologist. There may be a warning to take more regular exercise, less food, and less tobacco; or there may be instructions to lie recumbent for so many hours each day with a prescription for digitalis and nux vomica. In the latter event the situation is sometimes saved by a restless night as the result of the patient’s apprehension, together with the unwonted stimulant, and he confesses to his family doctor in the morning. A general overhaul is made—for the doctor has not had this opportunity for years—and a survey of the patient’s

habits is taken. Relief comes with the explanation that the heart is more sinned against than sinning, and with the substitution of a blue pill and a saline once a week for the nux vomica three times a day. Some commonsense instructions complete the advice, which results in rapid improvement in the general health. How is it possible that an unfit man can possess a heart other than an unfit one? The experience of the war revealed this fact in innumerable instances, not only in those who were mobilized for military service, but in those who stayed at home and made physical efforts of a different kind. These sudden changes in routine led very frequently to very complete examples of "effort syndrome": lassitude, giddiness with change of posture, nausea, precordial discomfort, sleeplessness and increased pulse frequency, of which the patient was painfully conscious. It often required a rest of some days or even weeks to adjust things. Digging for two days in a newly-made garden led to one such case that came my way. Helping to pitch the tents of a field hospital knocked out a colleague in similar fashion. I remember another colleague who described his condition very graphically to me: it resulted from running to give first aid to some children who were rescued from a fire several streets from his house. He had not walked so far for a long time, still less had he run so far. For several days and nights he suffered from a very definite "effort syndrome." Experiences like these lead me to suggest a slightly different reading of Lewis's dictum that "the healthy heart is never damaged by muscular exertion, however severe or prolonged that exertion may be." This surely depends upon whether or no the heart is in training. If for "the healthy heart" we read the "heart of a healthy man" I think the dictum is probably unassailable.

The factor of obesity is important in this connection,

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but I do not propose to give special consideration to it here.

(8) *The Nervous Heart*.—I incline to say—following my main thesis—the heart of the nervous patient. It is to be noted that Wilson and Carroll, in their helpful little book upon the subject, choose the term “the nervous heart” in preference to “irritable heart,” or “D.A.H.,” by which to express the condition that was seen during and just after the war in soldiers and in civilians, and in which the effort syndrome was manifested. As these authors point out, the condition was demonstrated to be of toxic origin in the majority of the cases. But in many, again, there was a general neurosis in addition to the cardiac disability. I have already referred to the toxic factor in inducing cardiac dysfunction. Here I am dealing chiefly with what Wilson and Carroll term the “surroundings,” or the stimuli to which the patient with his vague hyperexcitability is exposed. These nerve stimuli in the soldier were of a more massive kind than is usual in ordinary practice. Otherwise there is really no essential difference between the nervous heart of soldiers and the nervous heart of civilians. Shock, both emotional and physical, sometimes induces bouts of prolonged palpitation or other form of heart consciousness. The battle of life is capable of providing ample “surroundings” of the requisite kind to react upon the sensitive woman or man in the production of the nervous heart. These are very definite cases, and fully repay all our efforts at explanation and adjustment. They are to be distinguished from two other sorts of case, both usually included in the looser category of nervous hearts. The first of these is the patient who is merely apprehensive that his heart is diseased. This apprehension may be based upon some slight cardiac reference from the stomach or

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elsewhere, or it may have arisen from without—perhaps he has just lost a friend suddenly from heart disease. He enters our room with concern written upon his face and, before he sits down, makes us promise to “tell him the worst,” as he “is not afraid to die.” Being really good stuff, he leaves us with a cheerful countenance, being quite willing to be convinced that his heart is sound. The second type of patient is a much more difficult problem. He is the cardiac hypochondriac. Already his life is a burden by dint of his obsession, and the arch-fiend Fear has him firmly held in his powerful clutches. To him conviction is rarely easy; indeed, given the requisite means, he wanders from specialist to specialist, and it is not long before he meets the man who will feed his obsession. These different types of nervous heart trouble require very different handling, but the psychological need is present in them all.

Let me return, in closing these few remarks, to my thesis, expressing it in other words. These are not really toxic hearts, nervous hearts, pubescent hearts, etc.; they are hearts in toxic patients, hearts in nervous subjects, hearts of pubescent boys, etc. The patient is more than the heart, just as the patient is always more than the particular organ which is expressing a disease-process. To assess these cases aright, and to treat them adequately, it is essential to decentralize; to move away from the heart and its complex of symptoms to the rest of the body; to inquire about everything and to observe everything. Only in this way can the cardiac factor be properly interpreted.

The Cure of Varicose Veins and their Sequelæ.

By SIR SIDNEY ALEXANDER, M.D.

London, W.

THE art of curing varicose veins by the injection into them of some solution which chemically irritates the endothelium, producing a chemosis of the intima or *endoveinite* (Sicard) has received very great attention since an article by me was published in July, 1926, giving the result of my experience from May, 1925, when I introduced this method into England after seeing the brilliant and gratifying results obtained in Paris by Professors Sicard and Paraf. At the invitation of the Controlling Editor of THE PRACTITIONER I venture to add to the growing volume of literature on the subject.

This mode of cure appeals especially to the patient as the knife is not used, no anæsthetic is required, he can carry on his usual occupation of business or pleasure, the chance of recurrence is reduced to a minimum, no period of convalescence is required, while a feeling of well-being, even of exhilaration, is often quickly felt. *Joie de vivre* will be regained and a feeling of renewed youth experienced. Œdema of the legs, due to the enlarged veins and to lymphatic obstruction, disappears, the natural contour of the limb is restored and bandages and elastic stockings can be discarded.

The safety of the method depends on two factors: complete asepsis, and the fact that the solution injected does not of itself cause coagulation of the blood. Upon the irritated surface of the inner wall of the vein a thin layer of fibrin is deposited which quickly adheres to the opposing layer and rapidly becoming organized occludes the lumen and converts the length of vein

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elsewhere, or it may have arisen from without—perhaps he has just lost a friend suddenly from heart disease. He enters our room with concern written upon his face and, before he sits down, makes us promise to “tell him the worst,” as he “is not afraid to die.” Being really good stuff, he leaves us with a cheerful countenance, being quite willing to be convinced that his heart is sound. The second type of patient is a much more difficult problem. He is the cardiac hypochondriac. Already his life is a burden by dint of his obsession, and the arch-fiend Fear has him firmly held in his powerful clutches. To him conviction is rarely easy; indeed, given the requisite means, he wanders from specialist to specialist, and it is not long before he meets the man who will feed his obsession. These different types of nervous heart trouble require very different handling, but the psychological need is present in them all.

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the slight prick of the needle no pain should be felt, and while slowly injecting the desired amount it is always wise to question the patient as to whether he feels any pain, and, if he does, to refrain from putting any more in at that particular spot, however confident you may feel that you are absolutely in the lumen. When the injection is done, press a small sterile pad on the point of puncture and withdraw the needle quickly, keeping pressure on the pad all the time, and this pressure can be maintained by a rubber band while other veins are being treated.

On the first occasion it is not wise to give more than two or three small doses, as the reaction of the patient is not known. After a short period of repose the rubber bands are removed, and if the veins are prominent it is as well to apply round the limb strips of aseptic flesh-coloured isinglass plaster, which hardly shows through the stockings and helps to obtain a more æsthetic result. The injections may be given at about three days' interval, and in the case of salicylate in increasing strength.

The question of which solution is the best to use is a debatable one. Salicylate (with or without urethane) has some advantages over quinine in that it appears to have a more instant effect, often causing the vein to collapse along a considerable length, a large vein even becoming concave on its surface; the fibrin deposit, while equally firm, is thinner, and the final result somewhat more æsthetic. Then, again, varicose patients are often sufferers from rheumatism, neuritis, sciatica and painful flat feet; these symptoms are often quickly relieved while salicylate is being used. I have thought that the immediate satisfactory feeling of lightness in the limbs and a general sense of well-being are more marked after salicylate than quinine. It may also safely be employed in the early months of pregnancy, when it is of great benefit to afford some relief to the veins before they are subjected to extra

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affected into a fibrous cord, which tends in course of time to become still smaller, invisible to the eye, and almost imperceptible to the touch. This is accompanied by the freeing of the patient from the attendant disabilities such as pain, weariness, feeling of fullness in the legs, inability to walk or stand without fatigue, and the liability to eczema and ulceration.

I need not refer to the solutions tried by the pioneers of this method and discarded on account of their caustic or toxic properties, but will mention those which are being now chiefly used:—

(1) Salicylate of soda in 20, 30, 40, up to 60 per cent. solution in doses of from 1 to 5 c.cm. (Sicard).

(2) Salicylate of soda 20 to 30 per cent. combined with 10 per cent. chloride of soda (Meisen, Colt.); dose from 2 to 10 c.cm.

(3) Pure chloride of soda 15 per cent.; dose 5 to 15 c.cm. (Barber).

(4) Sod. sal. c. urethane 20 to 40 per cent., 0.2 gram urethane to 2 c.cm; dose 1 to 2 c.cm.

(5) Hydrochloride of quinine with urethane (4 grams quinine, 2 grams urethane, to 30 c.cm. distilled water) (Genevrier).

Whichever solution is selected, an all-glass syringe is used, with a needle No. 16 or 17 with a short bevelled point. The ideal position for the patient is lying on a couch; this presents little difficulty with the larger veins, but it is not always practicable with the smaller ones, when the legs should hang over the side of the couch. The skin is sterilized with spirit or ether, and the needle, slanting slightly upwards, is inserted into the lumen, but no fluid must be injected until a little blood is seen to enter the nozzle of the syringe (an all-glass one shows this more readily). A mere drop of blood is not sufficient, as that may have entered the needle as it passed through to the opposing wall of the vein. This is very important to note. Apart from

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have had a good many cases where hysterectomy has been done). (3) Trauma: quite a large number of cases say the varicose veins developed after an injury. (4) Heredity: it is very common to find several members of one family suffering from varicose veins, and this leads one to suggest some endocrine insufficiency, and perhaps along this line the future cure of early diseased veins will take place. (5) A compensatory enlargement of the superficial veins coming gradually on after thrombosis has occurred in the deep veins following typhoid fever and other prolonged illnesses. This constitutes an absolute bar to treatment by injection; I have had to reject a few cases on this account.

It is as well to make as thorough an examination as possible of the patient, but the only real contraindications are: (1) Pregnancy (after the fifth month)—merely as a precaution. (2) Deep, old-standing thrombosis. (3) Previous frequent attacks of phlebitis, as injection is very likely to set up a migratory form of inflammation. Old phlebitis is not an absolute bar, and quite good results can be got by sparse injections spread over a long period. The patient must, of course, be invited to consider a certain risk of temporary incapacity. (4) Claudication: As pointed out by Sicard, if this is suspected it may be diagnosed as existing along with varicose veins if walking increases the symptoms of malaise, cramp, etc., and rest relieves them, while the merely varicose patient finds his symptoms relieved by exercise. Age is no bar; in fact, my experience has been that elderly people do extremely well.

Naturally any serious case of heart disease with œdema is not a very suitable case, but as the cure of the veins improves the circulation in the limb and to that extent relieves the heart, I see no objection to the application of this method, though I have not actually done it.

A new era in the cure of varicose ulcers has been

strain. Against this, of course, must be put the fact, that though the actual injection of salicylate should be painless, a rather sharp cramp may be felt a minute or so afterwards; but this quickly passes off. With quinine there is no pain or cramp at the time, but a few days afterwards a certain amount of pain may be felt—more so than after salicylate; the deposit is generally larger; premature menstruation, or even metrorrhagia, may be caused, accompanied by abdominal pain, so that it is as well to warn the patient. It is also said occasionally to cause extensive fibrosis. When veins prove obdurate to treatment by one solution, another may quickly act.

I have obtained quite satisfactory results with salicylate and chloride of soda, but have not used plain chloride of soda, which has also been found quite effective (Barber).

Urethane combined with soda salicylate has some slight effect in averting the oncoming of cramp. Whatever solution is used the patient should always be warned of rare, but possible, untoward effects, such as a hot, tense, red and painful condition along the vein treated, due, perhaps, to a too abundant injection or subsequent traumatism; this soon subsides with a warm fomentation and a day or two's rest, "but incompetent advice may condemn the patient quite unnecessarily to bed for some six weeks under an anxiety provoking diagnosis of phlebitis and the menace of all its dangers and effects, and the subsequent curse of prolonged balneation" (Humbert).

One is often asked the cause of varicose veins: (1) Primary failure of the valves of the internal saphena, no doubt, precedes its dilatation (A. Aimes), and is mentioned as a cause; but, of course, this does not explain why they should fail, though it does explain the *varices occultes* of Delbet. (2) Undue pressure in the pelvic area due to pregnancy, fibroids, etc. (I

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On Clothes.

By PROFESSOR LEONARD HILL, M.B., F.R.S.

Director, Department of Applied Physiology and Hygiene, National Institute for Medical Research; Member of the Navy Medical Advisory Board; late Professor of Physiology, University of London.

NATIVE Australians keep twenty or thirty dogs to keep themselves warm at night. They strip a piece of bark off a big tree and put it round a smaller tree so as to protect themselves from wind, and crouch behind with their dogs. These are covered with fleas, but no matter, so long as a comfortable warmth is got. The woman carries the baby and all the family possessions, the man weapons only. Darwin describes the natives of Tierra del Fuego—the woman with babe at her breast naked and the sleet falling and melting on them, the man with an otter skin, the size of a handkerchief, worn on the back and shifted to the side struck by the icy wind. Stunted and hideous, they slept on the ground in forms like hares, and yet had to commit infanticide to keep the population down to the food supply. Channel swimmers—Webb, Burgess and others—have endured twenty hours in the cold sea. On the other hand, a London curate who asked my advice wore a thick llama wool vest, woollen shirt, woollen lined waistcoat, cardigan, tweed suit and wool-lined motor-coat; nursery training had instilled into him the fear of cold.

Primitive man, having little natural power of display by means of his skin and hair, took to daubing himself with colours, feathers, and shell necklaces, ornaments coming before the use of clothing for protection. By dress and personal adornment men and women display qualities of their nervous system, either to express their natural feelings or to conceal these. Woman's dress is rarely an expression of her modesty, generally

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opened up by the injection method. Old chronic ulcers, ulcers that are constantly breaking down, can be permanently cured if the veins in connection with them are obliterated, especial attention being paid to the *varices occultes* lying beneath the œdematous skin around the ulcer. At the same time local treatment is required. The administration of parathyroid and calcium assists the healing of the ulcer. It is sometimes necessary to refresh the indurated edges with the knife. The sensitive ulcer is much relieved by spreading unguentum Renaglandin on the surface and healing promoted by the use of stainless Biebrich scarlet red.

An attempt to remove by injection the red or purple arboraceous fine varicosities which sometimes disfigure the legs should be approached very cautiously, as necrosis of the thin skin is probable; in these cases doses of quinine and urea given subcutaneously without any attempt to enter the vein will often cause a blanching which persists.

In spite of every precaution and care a limited patch of necrosis may occur. This does not tend to spread nor to cause cellulitis, and slowly heals under treatment with hypertonic saline, etc. It is unaccompanied by fever.

The relief to the chronic eczema which so often complicates these cases is marked and is a good example of the removal of the cause, when possible, being the basis of all sound treatment. The superficial iliac and superficial epigastric veins sometimes become enormously varicose, but I have always found them yield readily to treatment.

In conclusion, I may affirm that the injection cure far transcends any of the older methods of excision, for the reasons given above, and also because a more complete obliteration of all affected veins can be made, and should a slight recurrence take place it is a simple matter to have a few more injections.

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of her desire for admiration and a husband. While men and women are largely judged by their appearance, intuition often detects the real character behind the assumed make-up.

The skin, with the hair and subcutaneous fat, forms the natural protective garment of the body. The fur of an animal keeps air stationary within its meshes and prevents loss of heat by convection. Air is a bad heat conductor, and warmed up to skin temperature it prevents heat loss and acts as an insulator. Fur and feathers have very great heat-retaining powers, coupled with great lightness and pliability. The feathered or furred animal must hold itself to the wind so that the hairs or feathers are not blown up and disarranged. If the thermal conductivity of air be called 1, that of wool fibre is 6, that of water at least 240 times that of air. The heat capacity of water is more than 3,000 times that of air. A given volume of fur consists of about 2 per cent. solid and 98 per cent. air. The water bird, such as the duck, by grease keeps the water out of its feathers, so that it is kept warm by the entangled air. Birds in the arctic regions where the temperature may be 35°C . and a blizzard blowing, have a body temperature of 43°C ., showing the complete protection afforded by feathers kept oiled and unruffled.

A guinea-pig's heat-loss in a room increased 36 per cent. after shaving; a rabbit, with skin both shaved and varnished, had it increased 140 per cent. in a room at ordinary temperature. The loss of body-heat was not only increased by convection, but by radiation. The child gilded to figure in a papal procession died—no doubt of cold.

A civilized man when naked and quiet finds exposure to still air at 35° to 37° not unbearably warm; 25° to 30° pleasant; 15° cold; 10 to 12° very cold. For sedentary occupation he secures an atmosphere under his clothes of about 33°C ., and only about 20 per cent. of

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his body surface is exposed to the air. An artist's model by acclimatization stands exposure for a couple of hours to 14°C. Children at elementary schools may be found wearing as many as thirteen different garments. I once unwrapped such a child on the stage of a lecture hall, and the eleventh garment was a red flannel binder. Custom and fashion impose on people clothing which is often unsuitable. It should easily be adaptable to change of weather. "I am more and more convinced," wrote a wise Scotch doctor to me, "that a great deal of harm comes from over-heating the body than is ever due to the influence of natural cold. Those who habitually go with little clothing show the greatest immunity to those diseases commonly attributed to the influence of cold."

The disability produced by clothes in a tropical climate has not prevented millions of negroes taking to them. In the Pacific Islands a kilt of leaves and coconut oil was the old habit. Clothes introduced by missionaries probably help to weaken and kill off the natives, but too much must not be put down to this account, for the natives are "unsalted" to the white man's diseases. Modern girls in their scant attire get the advantage of sun and air. They may be seen with bare arms, legs and necks, walking with the boys clad in trousers, coat and a muffler wound round their necks, so absurd are the dictates of fashion. The boy scout has bare knees and a shirt, but muffles his throat and wears a big, unnecessary hat. The girl guide is overclothed and confined by a dress designed by Victorian respectability.

Babies and children are usually much overclothed and have the natural vigour of their bodies thereby weakened. For example, a parent terrified of her child catching cold paid big fees for its inoculation against "colds," and put it out to live in the country, but insisted on the child being shut up whenever the

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weather was not fine, and on its wearing a double silk vest lined with thermogene, two Jaeger wool vests, a silk shirt, wool cardigan, leather waistcoat, and pilot jacket. In the case of a doctor's baby the nightclothes were a woollen nightcap, gloves, a woollen vest and pants, a woollen nightgown, large woollen socks, and then the baby was covered with blankets! Head sweating and evaporation from the lungs were its only means of getting rid of body heat. Contrast the children at an open-air sanatorium, naked in the sunlight and open air, whenever not too inclement, otherwise lightly clad in open-windowed wards.

In winter a man carries a tenth of his weight in clothes, while a dog carries only 2 per cent. in his fur. A woman in modern dress carries only half or less the weight that a man does, and there is no evidence that she suffers in health from discarding that excess which the Victorian women wore—in fact, she has gained. There can be little doubt that the modern fashion of scanty clothing for women has come about from the excess of unmarried women in the world and the instinct for sexual attraction. For the same reason women have taken to powder and paint and shingling of the hair. The powder and paint conceal the ill complexions brought about by sedentary city life and wrong feeding. The reduction of clothing has, however, done women no harm; they have suffered no more than men from “colds,” pneumonia and rheumatism; their death-rate has not been put up. The talk about “pneumonia blouses” was absurd. The secondary schools turn out many fine, healthy and athletic girls. The clothing has, however, been made so scanty through low necks, open bosoms, half-bare backs, bare arms, legs up to their knees covered only with thin silk stockings, that women demand the shutting of windows and putting on of fires when men in warmer clothing feel no such need—this is wrong. The scanty clothing of women should.

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not result in overheated stuffy houses and hotels in which the air becomes polluted with dust and microbes which occasion respiratory disease. The clothing should be the lightest that can be borne without the wearer being pinched with cold or feeling the need of artificial heat when the weather is mild. It should not be so heavy as to reduce the heat production of the body to a lower level and interfere with the taking of vigorous exercise. Such exercise may increase the heat production five times or more, hence the scanty clothing of athletes. It is absurd, then, to put on an overcoat when going out for a walk. It is good to go out and be braced by feeling cold and so be impelled to take vigorous exercise. It is only the old, the underfed and feeble who require very warm clothing, those whose fire of life is weak and cannot be fanned up by vigorous exercise. Those, too, in a state of shock from injury, those anæsthetized, and the paralysed who have lost the power of heat regulation require careful clothing and warmth. It must be borne in mind that the paralysed and anæsthetized may easily be overheated by hot bottles and too much clothing.

Clothes need to be not only as light as possible, but permeable to air, allowing free evaporation, becoming to the least degree wet with sweat, not clinging to the skin when wet. The cellular structure produced by weaving, whether of wool, cotton, linen or silk secures conditions which give warmth, softness, compressibility and elasticity, permeability and evaporative power. Smooth, closely-woven and glazed materials are unsuitable, except for a protection from sun, e.g. the pith helmet or flowing robe of the Arab.

The winter and summer pelts of domestic animals, such as the horse and cow, show the small extra amount needed to face the open-air life and the winds of winter. Thick undervests and heavy overcoats and furs are needed not by citizens but, by arctic travellers and

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piece of black fur with the bulb of a sensitive thermometer and use this as a means of measuring the radiant energy of the sun. On a bracing day on the East Coast cliff in the shade and wind the air temperature was 13·8, the black fur 22, white flannel 19°C.; in sun and shelter from wind the respective readings were 14·5, 43, and 36°C. These figures show the great difference made by radiant energy of the sun and shelter from wind. On a July day in the sun black fur may go up to 60°C. The effect of the sun on the sheltered body dressed in black may then be most potent. The surface of black clothes may become 20 to 25°C. hotter than the air. The light that penetrates between the fibres of fur, cotton wool or feathers is reflected to and fro and so absorbed. The surface reflects more in the case of white, and therefore the temperature is lower. On a July sunny day with cooling breeze the following readings were obtained, e.g. black fur, 57; white fur, 35; dark woollen rug, 41; white cotton wool, 36; fine white linen, 30°C.

Wool has an elastic fibre which keeps the woollen garment off the skin and secures an air layer beneath, facilitating evaporation and preventing the clinging wetness of a smooth cotton garment when sweating. Woollens are soft, compressible and elastic. On the other hand, they shrink and thicken through washing. A fine linen or cotton is far cooler than a flannel because of its thinness. Linen or cotton woven equally thick and cellular, so as to hold air, is as warm as flannel. The claimants for systems of clothing all wool, linen, etc., have based their claims on the nature of the fibre, while the properties of the garment depend almost wholly on the nature of the weaving so far as concerns air-holding, evaporation, and permeability to wind and light. Dr. Jaeger upheld the reduction of metabolism by warm woollen clothing as a means of preserving life, as if the body burnt out like a candle—an absurd

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soldiers standing in freezing trenches. "The horse," says Carlyle, "is his own sempster and weaver and spinner, nay, his own bootmaker, jeweller and man milliner . . . a perennial rainproof of court suit on his body wherein warmth and easiness of fit have reached perfection. . . . While I, good heaven, have thatched myself over with the dead fleeces of sheep, the bark of vegetables, the entrails of worms, the hides of oxen or seals, the felt of furred beasts . . . a moving rag screen overheaped with rags and tatters raked from the charnel-house of Nature." Fur and feathers have enormous heat-retaining power coupled with great lightness and pliability. The clothes require to be fashioned to attain these ends with easy adjustability to climatic changes, and combined so as to allow a man to work with ease. They are fashioned largely to satisfy vanity, impose on others, and maintain a false value of sexual selection, selection which should be based on perfection of body and character.

The temperature of the skin under the clothes is some 3°C . warmer than the naked parts of the skin in a cold room, and about 1° warmer in a warm room. The temperature between the shirt and the body in ordinary clothing is about 30°C . when in a room; it may fall even to 14°C . when one is exposed in ordinary clothing to a cold wind on a frosty day. When warm and sweating, the air between the shirt and the body is nearly saturated with moisture, e.g. dry bulb 29, wet bulb 27.5. In a warm room the loss of sweat may be trebled or quadrupled by clothing compared with nakedness.

Fur and feather-down show very considerable inertia both in taking up and losing radiant heat, and thus keep, when exposed to wind and sun, a far more constant temperature than a thin, smooth, black surface, such as blackened foil, e.g. black fur 37 to 37.7°C ., black foil 37.7 to 23.2° , as the wind blew or not. I stroke a

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tion and evaporation made easy, but also loss by radiation to cooler surroundings. If the sun shines on the naked body, there is gain of much radiant heat, while the action of visible and ultra-violet rays on the skin is obtained.

A correspondent wrote to me that he had left England, being a chilly mortal, to find a warmer climate. He was now running a banana plantation on the side of a mountain, and tried sun-bathing and discarding his clothes when at work. He quickly became acclimatized. "I work naked some days in a bitter cold wind driving light showers on me; at times I take off my pants and sit or lie down on the cold wet ground and enjoy the nice cold feel of it on my bare skin; winter has no more terrors for me. I go driving with thin cotton trousers and a thin cotton singlet unbuttoned, my chest all bare. Now it is 9 p.m., and a fortnight from midwinter day, I am sitting here perfectly naked, writing this in a cold, draughty house on a bare wooden chair, and the very same spot where this time last year I could not sit without a cushion on the chair, an extra pair of thick woollen trousers, a thick flannel shirt, a woollen sweater and a heavy overcoat." The slum children affected with surgical tuberculosis taken from warm, stuffy tenements similarly quickly become acclimatized to exposure naked to sun and air, and respond by becoming happy and virile.

People in all classes over-clothe children and confine them far too much in hot, stuffy rooms. A safeguard of the health of the poor is playing in the street; mistaken philanthropy has striven to turn them into play-rooms. Babies are not delicate, but able to withstand exposure to cold just as a naked pigling stands it, nestling among its fellows and against its mother, but exposed to open air. Think of the Fuegian baby naked at its naked mother's bosom with the sleet falling on it, described by Darwin. Through some hundred

view! We now know that the Victorians were all wrong in their fear of cold, coddling in shut up, heated rooms, with sand bags to keep air from entering by cracks of doors and windows, wearing heavy clothing, and fearful of going out in night air or rain.

The better health and longer life of open-air workers, those most exposed, such as shepherds, fishermen, agricultural labourers, compared with city folk, and the success, too, of the open-air treatment of tuberculous people and weakly children has shown the absurdity of such views. Girls have become much more healthy and vigorous through the freedom from a coddled and restricted life. We want to let the lamp of life burn brightly, to run the metabolism at a fairly high level, by means of exposure to cold and exercise, not at the low level of a Singapore native student whose whole daily metabolism is not more than the resting metabolism of an athletic young Englishman. Good appetite and digestion, prevention of constipation, good health of the respiratory organs, nervous vigour, good looks and happiness depend very largely on the deep breathing and heightened circulation and proper utilization of the food eaten, which result from exposure to cold and exercise. By the taking off of clothes and by fan ventilation work can be carried out even in warm factories and climates without excessive call on the sweat mechanism, and the heart saved from the fatigue of pumping much blood through the skin to cool the body. It is most important for performance of efficient and economical work that such simple means of cooling should be used. Fashion and custom should not prevent people taking off outer garments when feeling too warm. On hot summer days, workers in offices, shops and factories should be encouraged to take off excessive clothing and work in shirt sleeves or light overall.

By nakedness not only is the loss of heat by convec-

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water at the same temperature. In the sunlight, dry white skin gives a diffusive reflection almost double that of dry dark negro skin. The black skin, therefore, absorbs more and becomes hotter. In a black and white animal exposed to the sun the black patches of fur may be many degrees hotter than the white. If two broad shoelaces be taken of the same material, one black and the other white, and they be suspended with the lower end of each dipping into a measure glass of water, the black will in the sun become warmer and evaporate far more water. In the case of the black skin the sunlight absorbed by the pigment in the deeper layers of the epidermis and converted into heat increases transpiration of water from the capillaries, and evaporation from the surface. The nerve endings which provoke sweating are excited by the heat, and water poured out makes the surface glisten and act as a polished surface reflecting sunlight. The evaporating water vapour surrounds the body with a film of vapour which absorbs and lessens the sunrays. Thus the black man is protected from over-heating. A thin layer of melanin, prepared from the pigment of ox-eyes, spread on a moist hand, protects it from sunburn. The light is absorbed, converted into heat, and the energy spent in evaporation.

Melanin in the skin of the negro then protects him by absorbing the sunlight and exciting the nerves which provoke sweating. The moist skin reflects light and evaporates away heat. The pigmented skin can be thin and the blood-vessels near to the surface so that heat loss by convection and radiation in shaded parts is active. While the blood in the skin is protected by pigment from excess of visible rays, the horny layer of the epidermis absorbs and protects the living cells from ultra-violet rays. This layer is thickened by death of living cells when sunburn occurs. Pigment, no doubt, has been evolved partly for purposes of

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thousand years wild men have withstood exposure before clothes were invented, and there are wild men who still withstand it naked. The baby is born with the power to withstand the environment, whether it be the child of a savage or a citizen. A few score years of sheltered civilized life have not changed this inherent power. Babies well fed, and given exposure to open air and sun naked, with plenty of kicking and crawling exercise, long sleeps out of doors, and light clothing, grow up virile, with strong muscle and firm bones.

The evolution of the warm-blooded animal has taken place through animals which, when warmed by the sun, succeeded by their activity and so came to evolve mechanisms for maintaining the warm body temperature by lessening heat loss in the shade and increasing heat production by combustion of food. The Platypus and Echidna of Australia show a partly evolved heat regulating mechanism.

Tropical lizards expand their pigment cells and absorb the sunlight, becoming warmed up to $39^{\circ}\text{C}.$, and very active. They prevent over-heating by rapid hollow breathing, evaporating water with open mouths. At night they cool and become inert. A greenhouse temperature of $80^{\circ}\text{F}.$ given to these animals at the Zoo was no good, for they were not warmed up enough to become active and eat and so died off in the winter. I suggested that they should be warmed by "closed up" incandescent lamps; this has proved effectual.

The mistake has been made by Woodruff and others of supposing that, at body temperature, black radiates more than white, and that a high emissive power of the black skin for radiant heat adjusts the negro to the warm humid shade of the forest; this is not so. At body temperature the emission of black is the same as white, as proved by the classical experiments of John Leslie (1804). I have found that the radiation emitted from the skin is the same as from a glass of

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Under normal open-air conditions of a temperate climate the cutaneous tissues and extremities are cooler than the deeper parts of the body. In tropical conditions, when heated by hard work, when in hot baths, all parts of the body reach or exceed normal body temperature. The normal, average rectal temperature of people having open-air treatment in cool weather is 97.2°F. at 9 a.m. and 98.6°F. at 6 p.m. The average temperature of soldiers resting on a warm day was 99.56°F. In an artist's model exposed naked for two hours at $14\frac{1}{2}^{\circ}\text{C.}$ there was a difference of 10.6°C. between the warmest and coolest parts of the skin, e.g. the waist and the calf. At 25.8°C. the difference was 5.4°C.

The body temperature is from 0.5 to 1.0°C. higher in the tropics. Walking in tropical heat raises the temperature to 103°F. , so may a strenuous game of football on a cold day. Exposed to hot sun in thick black hair the thermometer may rise to 50°C. , but on the cheek not above 37° , sweating then breaking out.

The Indian coolie oils his skin and so reflects off sunlight. In tropical countries thick walled stone buildings afford shelter from the heat of the day. These cool by night, and the sun has not time to warm them up much by day. Fans help greatly in the tropics. Where the air is dry and in movement and the body naked, or very lightly clad, evaporation of sweat is effectual. Heat-stroke can be prevented in those whose sweat glands fail, by wetting the skin and fanning.

The limits of the power of body heat regulation in still air are reached at 90°F. , wet bulb, not uncommon in North Borneo, and 93°F. in air moving at two miles an hour. Miners stripped have worked with wet bulb varying between 80 and 93°F. , but the work is inefficient. It is most important to secure proper cooling of the body of workers, by suitable clothing

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camouflage, "an adaptation to the environment." A rough, thick skin and thick layer of fat protect the polar tribes from heat loss when exposed to cold air with low vapour pressure. In the dry temperate climate of the prairies a fairly thick epidermis and some pigment are needed. In dry, tropical, sunny climates dense pigment and thick scarfskin are required to protect from light. Jungle and forest tribes have the colour of old ivory, orange rather than brown. The Scandinavians—with moist, cool climate and plenty of light—are fair.

Native Arab children race along the banks of the Suez Canal begging, while the white people on the decks of steamers, over-clothed, over-fed, unacclimatized, lie suffocating with heat. The customary furlough allowed to white men in the tropics, and the fact that they send their children home to ensure their upbringing, shows the strain put upon them by the climate. Infective diseases are the great cause of high morbidity and mortality in the tropics, but with prevention of these the strain remains.

Convention keeps children hatted and clothed, and pride of race makes mothers thus preserve their whiteness. They should wear only a loincloth, tan in the sun, be in and out of water, and live open-air lives. Indoor conditions make white women in the tropics fade, age and become barren.

Monkeys, on a suitable diet of rice and bananas, can be acclimatized to exposure to the tropical sun, the acclimatization depending on the efficiency of the sweating mechanism. The conditions which favour heat-stroke are a hot ground, high humidity and little wind, and crowding. A white man can acclimatize himself to labour in the tropical sun, as in the sugar-cane plantations of Queensland or our soldiers in Palestine in the Great War, provided he is not over-clothed or overfed.

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screened with the naked skin, however, the transmission by artificial silk is seen to be very small, 80-90 per cent. being reflected or absorbed. The only garment suitable for sun-bathing is an open-mesh net in a single layer, and it matters little of what material it is made. Even this will screen off about half of the active ultra-violet rays.

The absorption of visible rays of sunlight by clothes depends largely on the colour; if the absorption of a white garment is called 100, the relative figure for dark colours will be 150-170, and for black over 200. Black or dark garments are then worn in cold climates and white in warm, sunny ones. Clothes for the tropics should have great reflective power, little absorptive power, allow little penetration of the sun, and good ventilation. A flapping loose robe provides the requirements, or shorts widely open at the knees and a loose shirt, short in the arms, slits in the sides and low-cut in the neck. The shirt can be left flapping, not tucked into the shorts. The thighs and arms swinging in walking and the respiratory movements pump air in and out of loose shorts and sleeves, while the sway of the body and flap of his robe ventilates the Arab. A light sun helmet is required made of a close-woven, white, reflecting surface; to this a non-inflammable net hood may be fitted which allows smoking and prevents insects biting. Trousers and double socks in the evening protect the legs from insects. It has been suggested that red linings should be added to white garments to absorb the active rays of the sun. There is no advantage in this, and the lining increases the heat.

All bungalow, carriage and tent roofs require to be double in the tropics; the air space between the layers must be freely ventilated. So, too, with ship awnings. Such ventilated air spaces give very great protection. Corrugated iron buildings with no air spaces are the

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and ventilation. The normal heat production of a resting man is balanced by a heat loss of about 1 mille calorie per sq. cm. of the surface of his body per second. When at work by some 3 mille calories. The absorption of the unclouded sun by a black surface may equal 30 mille calories per sq. cm. per second. Suppose one-third of the surface of the body is exposed to the sun and half of the radiation is reflected by the skin, then 5 mille calories per sq. cm. per second may be absorbed. This shows how a man working in the hot sun, or in front of a flaming furnace, is in danger of over-heating. The conditions for producing heat-stroke are given by soldiers heavily accoutred marching in close column in the full blaze of the sun on a calm day. The air surrounding their sweating bodies becomes heated and saturated, while the sun heats their clothes. Open order, and stripping off of clothes, unheating diet, and adequate water and frequent rests are the measures to take for marches on hot days.

In pith helmets worn by soldiers sitting in the sun in India, the temperature rose to $109.4-111^{\circ}\text{F.}$; walking about in the wind to $100-105^{\circ}\text{F.}$ It made no difference whether the lining of the helmet were coloured or white, for no light rays penetrate the white outer wall of the helmet. Adequate ventilation of the helmet is essential, and a close-textured white surface which will reflect the rays. Even a single layer of a net or muslin will cut down the transmission of light and ultra-violet rays to the skin by as much as 50 per cent. A black stockinette will cut out more than a white of the same mesh, owing to absorption of the rays scattered by the fibres of the material. If a screen of thin, close-meshed material made of artificial silk be compared with a similar one of real silk, by estimation of the erythema produced on the skin by sunlight or an arc light, it will be found that the artificial silk transmits more of the active ultra-violet rays. Comparing the

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calculated for 1 cm. thick, with a given water pressure. Dressed linen is ten times less permeable than undressed. A thick cotton five times less permeable than a stockinette. The smooth lining of a woollen coat halves the permeability. Smooth linen, cotton and silk stuffs vary in thickness from 0.16 to 0.4, knitted 0.6 to 1.2, flannel 2 to 3, overcoating 6 to 7, fur 12 to 40 mm. Tropical clothing has a thickness of less than 2 mm., winter clothing 12 mm.

The heat-retaining efficiency of clothing materials can be evaluated by means of the kata-thermometer. This is a large-bulbed thermometer of standard shape and size filled with coloured alcohol. The stem is graduated from 100–95°F. The bulb is heated so that the meniscus rises above 100°F., and the rate of cooling is measured with a watch as the meniscus falls from 100 to 95. By means of a factor the rate of cooling is converted into cooling power expressed in millicalories per sq. cm. per sec. The cooling power exerted by still air on the "kata" was lessened some 25 per cent. by a thick knitted wool glove, and 35 per cent. by this covered with a thin rubber glove. Exposed to a light breeze the lessening became 55 and 68 per cent. The kata-thermometer clothed in a thick woollen glove gives about half the cooling power out of doors which the naked instrument gives. When in very cold weather the clothed "kata" readings were about 20, and the naked "kata" about double as much, two overcoats, thick gloves, and a muffler were needed, and even then one had to walk about or shelter from the wind to keep warm. When the clothed "kata" reading was about 10 on sunny, very bracing days, a rug and overcoat were required for sitting out; with the readings about 3–5 and the naked "kata" 6–10 on sunny days, one could sit out in ordinary clothes.

The kata-thermometer can be used to show how important an insulator is the air entangled in the

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worst possible for the tropics. All outer surfaces must be white to reflect the sun; wide verandas are required to give shade and the house oriented to secure all the breeze possible. The ideal protection from heat for a white man in the tropics, when decency does not forbid nakedness, is an umbrella and a fan. The nearly naked native seeks the shade as does a monkey, or wears an umbrella-shaped hat. For sleeping in the tropics a hammock or bed-floor made of canvas or Japanese matting should replace the mattress.

A suitable light diet as well as light clothing and fans are essential for white men in the tropics. If a fasting man be placed in an environment which reduces his heat production to a minimum, and then be given protein to eat of the energy value of 100 calories, his heat production will be increased to 131 calories: the figure for fat is 113, and for carbohydrate 106. Heat production is then enforced to the high specific dynamic energy of protein: the amino-acid products of protein decomposition stimulating the living cells.

In hot climates proteins should be reduced and carbohydrates increased; on the other hand, where there is great exposure to cold more meat is required. In tropical climates, fruits, salads, green vegetables, rice, and a little fish, bird and dairy produce afford the best diet. In the arctic regions meat and fat form the larger part of the ration.

Flannel is made up by volume of 90 per cent. air and 2 per cent. solid, overcoating 75 to 80 per cent. air, smooth materials at least 50 per cent. air, but starching and glazing may make a material almost airless. Leather contains about 40 per cent. of air, and the grease in it prevents the permeation of water. The permeability to wind is least for smooth, closely woven thick stuffs, and most for thin, loosely woven materials. It can be measured by the time it takes to force 1 cm. of air through 1 sq. cm. of surface of material and

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Clothing materials are very hygroscopic. When quite dry, I found flannel takes up about 40 per cent. of its weight of water. Rubner found the absorption of water by dry cotton and silk about half that of dry wool. Dry cashmere, he says, increases 12 per cent. in volume on absorbing water. The absorption of water by dry clothes raises their temperature, a rise due to a reversible reaction between the water and the surface of the fibres of the clothing material. A similar production of heat occurs on absorption of water by such dry material as starch, the hydration being accompanied by a condensation of volume just as that which occurs when water and alcohol are mixed. Three layers of clothing material wrapped round the bulb of a thermometer and made quite dry may heat it 10°F. when suspended in an ordinary room and allowed to absorb moisture from the air. Hence the warm feeling which well-aired, dry clothes have when put on. The actual heat produced by the absorption of water by one gramme of dry cotton was no less than 22 calories. Clothing materials take up a great deal of water when soaked in it, the more air they contain in their pores, the greater being the uptake. Rubner found that 1 kilogramme of knitted silk took up 1,409 grammes of water; cotton, 1,180; wool, 1,400. The different materials allow water vapour to penetrate with about equal ease. A woven, highly-cellular material preserves its air-holding properties very largely when wet, and thus still protects the body from loss of heat by convection; this may be very important when people are immersed in cold water. The loss of body heat by evaporation is greatly increased through wet clothes. Rubner found the clothing of a soldier took up nearly 4 kilogrammes of water. To evaporate this amount, an amount of heat is required equivalent to the whole day's production of a sedentary worker. Wet clothing materials stick to the skin, but flannel

clothes. If a garment be pulled tight round the "kata" its protective power becomes very small. A rubber glove pulled tight over the bulb of the "kata" gives almost no protection; put on loose with a little fluffy wool underneath the protection given is very great. When gloves of knitted cotton, linen, wool, etc., are compared on the "kata" it is made evident that the nature of the material makes little difference and that it is the air entangled in the meshes which protects. Three garments put on the "kata" bring down the cooling power to about one-third of the naked "kata." If the outermost garment which is equivalent to an overcoat or raincoat be wet, the protection it affords from loss of heat will be almost as much as when it is dry, the evaporation from the cool outer garment being small. On the other hand, if a single wet garment clings to the "kata" the loss of heat is very great, owing to rapid evaporation, the garment in this case being warmed up to the temperature of the "kata." Covered with a thin netted silk glove and wetted, the "kata" becomes a measure of cooling by evaporation as well as by convection and radiation. The cooling power of the wet kata-thermometer placed between the shirt and the skin of the body is about trebled when a table-fan is directed to blow on to the body. The effect of fan ventilation on cooling by evaporation of sweat can thus be demonstrated. The cooling power exerted by still water on the "kata" is fourteen times that of still air at the same temperature. Stirring the water or a current of water exerts much greater cooling, just as wind does. If a thick woollen glove be loosely put on and covered with a thin rubber glove, and this tied on the stem so that no water can enter, the two together protect the "kata" from cooling in cold water very greatly, e.g. they may make it one-seventh of that of the naked "kata." The protection becomes considerably less when the wool glove is wet.

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least owing to its elastic solid fibres. Wet flannel, therefore, entangles more air next to the skin and is warmer than cotton or linen. The heat conductivity of cotton is increased over three times when wet, of flannel only one-half.

Cool, misty, damp atmospheres feel chilly owing to the dampness of the clothes and increased loss of heat by evaporation, conduction and radiation. Radiation from sun and bright sky, from warm ground or walls and surroundings makes a very great difference to feelings of comfort. Water birds grease their feathers to keep them dry and unruffled by wind and continually groom them. Young ducklings and chicks are easily killed from cold by being wet. We wear waterproofed outer garments protective against both wet and wind. Dry greasy skin has a lower heat conductivity than wet skin. Well greasing the skin prevents water soaking in. Hence Channel swimmers are thickly smeared with lanolin.

A naked pigling in a cold water bath lost three times more body heat than a dog of the same weight. Just as the dog is protected by its fur, and a duck by its feathers, so the clothes are a protection against loss of heat when one is immersed in cold water. It is the air entangled in the fur, feathers or clothes which protects; the clothes also retain water which gets warmed by the body, and thus prevent the flow of cold water over the skin.

In ships to which wireless can bring succour in a few hours, rafts are more useful in case of wreck than boats; more of these can be carried, and they are far easier to launch. Exposed on rafts, people want warm clothing and waterproofs to keep them from dying of cold. Dr. Argyll Campbell and the present writer made a number of observations on the rate of heat loss from the body of a subject exposed to wind or to the sea waves either naked or in light clothing, or in such

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clothing plus waterproof suit. The protection afforded by the last was great, reducing the heat loss by one half. The resting heat production of the man was trebled by exposure to sea waves when clothed in a summer suit. Swimming naked in the sea puts up the resting heat production seven or eight times. It is not food and drink, but a waterproof garment which is required to keep life in shipwrecked folk on rafts till succour comes. Lefevre found the heat loss of a naked man at 4.5°C . and 2 metres per sec. wind to be two times greater than when clothed.

Sitting in wintry weather, slight breeze and snowing at times, I found the heat loss increased some 75 per cent. by stripping off a thick overcoat and muffler from thin indoor clothes. The cooling power of wind is enormous when the temperature is low and the velocity of the wind great. To resist this, flying or Arctic clothing must consist of an outer layer of wind-proof material—strong, but light waterproofed cloth will do, and inner layers of soft fluffy woollens entangling plenty of air; the garments must join and overlap so that no wind is let in at the neck, wrist, waist or ankle. There should be a tunic with head-cover in one piece, fur gloves pulling up well over cuffs and confined there by straps, trousers coming well over tunic and confined by a belt, long boots made of supple hide coming well over trouser-legs with soft woollen socks inside. Air-pilots can have the advantage of an electrically-heated pad under their clothes. The great trouble of Arctic travellers is the moisture taken up by their sleeping bags, which freezes by day and has to be thawed by night. The problem is how to get rid of this moisture and yet keep warm. Wolverine is a fur upon which moisture is said not to condense and freeze. It is used as a headdress by Eskimos.

Rumination (Merycism) in Infants.

By DONALD PATERSON, M.B., M.R.C.P.

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IN a study of groups of infants failing to gain in weight, among the most interesting cases are those of ruminations. As the name implies, these children tend to rechew their food, and in so doing spill it from the mouth, failure to gain resulting. In a study of such cases at the Out-patient Department, the Hospital for Sick Children, Great Ormond Street, a number of ruminators have been seen by the author.

When brought for attention the infant is usually between the ages of three and seven months and is most often only slightly more than its birth weight. The condition is definitely more common in girl babies than in boys, and in a specially bright, intelligent, eager type of child who takes a tremendous interest in its surroundings.

The mother seldom complains that her child is vomiting badly. It is rather that it is failing to gain in weight. Occasionally, however, the complaint is of a large daily vomit. On questioning it will be ascertained that the child's pillow is always wet, but that the mother has seldom seen the child bring up more than a few mouthfuls of food at a time.

Cases of ruminations commence shortly after birth, and when seen are best examined from behind a screen, so that the child is unaware of the observer's presence. Immediately after a feed the infant will be seen to strain and arch its back, struggling as if uncomfortable.

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The food then wells up into the gaping mouth, where the tongue is slightly protruding in a funnel-like shape. Gulping and chewing movements are made with the jaw, and at the same time the milk is spilt from both corners of the mouth. This struggling, with regurgitation of the food and re-swallowing of part of it, occurs over and over again, until a large proportion of the feed has been wasted. Those feeds which are too dilute and which are at the same time very sweet conduce to this habit, since with too large a feed there is naturally a tendency to regurgitate or spit up the milk, and when the feed is very sweet the pleasant taste is quickly brought to the infant's attention. Very high fat mixtures, causing a *fat dyspepsia*, may also predispose to the habit. Occasionally the mother or father of the child may have been similarly affected as an infant. As an instance:—

Edward C. was born weighing 7 lb. An only child, he came under observation at the age of four months weighing 10 lb. 1 oz. He had been spitting up his food from birth. He was breast fed for 10 weeks and then had a sweetened condensed milk feed. Cow's milk was added to the sweetened condensed milk, and the whole was thickened with Savory and Moore's Food. He gained 19 oz. in the first week and 40 oz. in 40 days. His mother produced an old Great Ormond Street Out-Patient letter, dated 1904, which showed that she herself had suffered from a similar complaint as an infant.

It is interesting to note that the child will refuse to ruminate in front of the mother, doctor or nurse. In fact, it seems ashamed of this habit. Standing at the head of the bed, and peering over or through a screen, however, the whole process can be readily watched. It is because of this refusal to ruminate in the presence of anyone else that the mother often fails to appreciate the quantity of food which is being lost daily by spitting and regurgitation. The author has given a number of these cases bismuth, and the X-ray has shown that this passes rapidly from the stomach into the intestine with no delay. A post-mortem examination of occasional cases who die of gastro-enteritis or

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other acute infections shows no organic disease present. The complaint is therefore purely a functional one.

There are various methods of treating this condition. Some facetious American observers were able to drop a solution of quinine into the widely open mouth of the ruminating infant, and to note with what distaste the child received this. Certainly the habit was checked for the time being. Plugging the nostrils with cotton wool, so that the infant is forced to breathe continually through the mouth, is also said to be successful. Picking up the infant after its feed and keeping it thoroughly interested, at the same time being present with it, acts as a strong deterrent. A skull-cap with strings which tie tightly beneath the chin, thus preventing the mouthing and gulping movements, has also sometimes proved successful.

No method, however, compares with that of thickening the feeds. This is best done with some starchy food, such as Benger's Food or Savory and Moore's Food. Robinson's Patent Groats or Groult's Cream of Rice or the American farina, however, are equally successful if very well cooked and prepared. The cereal should be slowly thickened until it is like moderately thick porridge, and it can then be added to a cow's milk-and-water feed or to the feed which the child is already having. The rationale of this is dependent on two facts. First, that it is more difficult to vomit a thick substance than a thin substance, and, secondly, that by raising the caloric intake, even if some of the feed should be vomited, the high-caloried remainder is probably sufficient to make the child thrive. An example of the success of this method is given by the following case:—

Marjorie E., an only child, was born weighing 6 lb. 14 oz., and when six months old weighed only 7 lb. 3 oz., that is, a gain of 5 oz. in six months. From the third day she had been spitting her food up and kept her pillow continually wet. She had been tried on a variety of feeds, all well diluted. She was put on cow's milk

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and water, thickened with Benger's Food, and in the first 7 days gained 28 oz. In 14 days the gain was 33 oz.

An analysis of some seven cases shows the ages of these infants to range from three to seven months. Five were girls and two boys. The average birth weight was about 7 lb., and at an average age of $4\frac{1}{2}$ months the babies weighed 9 lb. Four of the seven were only children, the other three being the second, third and eighth child respectively. Almost all had been vomiting from birth or within a few weeks after birth. The type of feed which these infants were having when they came under observation varied, but without any exception was thin and dilute.¹ On cow's milk with Benger's Food or groats added, all these seven cases did extremely well. One case gained 28 oz. in the first week, and one 19 oz. All gained an ounce or more per day. It was interesting to note in one case that the best results were obtained when the child was a little older and able to be put on to really solid food, such as gravy and potato or porridge and egg.

Probably no condition goes unrecognized more often than that of ruminations, nor is there any condition which responds more readily to careful treatment. An occasional gastric lavage is a very great help, and although this is not essential it seems to have a most beneficial influence on the infant.

Reference.

¹ Paterson, Donald, and Marr-Geddes, A.: "The Frequent Occurrence of Underfeeding in Early Infancy," *Archives of Disease in Childhood*, vol. ii, No. 11, October 1927.

Some Medical Emergencies in Childhood.

By J. C. SPENCE, M.C., M.D., M.R.C.P., etc.

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IT is in the field of advice rather than of action that the physician's work lies. Nevertheless, occasions do arise when, by acting promptly or advising quickly, he may forestall calamity, and these, without further definition, may be looked upon as "medical emergencies." The immediate treatment of diabetic coma and poisoning are obvious examples; but it is no less an emergency that prompt advice should be proffered to the man complaining of substernal tension that he must now and for ever forsake his favourite pastime of rock climbing, because the days are gone when he can remain *schwindelfrei* at giddy heights. Amongst children, examples of medical emergencies are more frequent for the reason that their reactions to disease are more violent and extreme, and I may choose and mention a few which are likely to be encountered in any practice: (1) hæmorrhagic disease of the newborn; (2) vomiting from hypertrophic pyloric stenosis; (3) diarrhœa and dehydration; (4) the birth of an infant in a tuberculous household.

§ In each of these conditions something can at times be done to avert calamity. In two of them active measures of treatment are necessary, in the other two prompt advice is necessary. Otherwise we may be left to mourn the fact that we have left undone those things which we ought to have done, which is the medical counterpart of the surgical sin of having done those things which ought not to have been done.

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HÆMORRHAGIC DISEASE OF THE NEW-BORN.

This is a disease from a cause unknown which affects apparently healthy babies. Within a few hours of birth, bleeding commences from the mucous membranes of the gastro-intestinal tract, from the umbilicus or from the vagina. It is a disease *sui generis*, and is to be distinguished from the bleeding and purpura which begin to appear in the second week as a symptom of septicæmia or syphilis. In the severest cases obvious mælæna or hæmatemesis are seen during the first twenty-four hours, and if untreated they die in the second or third day. On the other hand, there are milder cases in which slight mælæna continues for four or five days and then ceases spontaneously, allowing the child to make an automatic recovery. But, taking all in all, it is a very serious and fatal disease unless the bleeding be stopped; and it is for this emergency that treatment should immediately be given.

The right and proper treatment is to inject some of the parent's blood into the muscles or loose tissues of the infant. The amount to be injected will vary with the severity of the case, but it is usually sufficient to give 10 to 20 c.cm. three times during the first day, twice during the second day, and once on the third day. It is my own practice to choose the mother as the donor, but either parent will do. All that is required is that the blood should be withdrawn directly from the vein of the donor in a 20 c.cm. syringe and immediately injected into the buttock or elsewhere in the child, before any clotting can take place in the needle or barrel of the syringe.

The effect of the injection is immediate and striking. It appears to act by supplying some factor lacking in the infant's own blood, which stops the bleeding. This indicates that the success of the treatment is due to a hæmostatic action of the donor's blood, and not to a mere replacement of blood which has already been

lost. When the bleeding has been checked and controlled for two or three days there is no liability for it to recur, and the cure remains permanent. The probable explanation of this is that by the sixth or seventh day the infant's own tissues become capable of providing the hæmostatic factor which was missing for the first few days of its own independent existence.

VOMITING FROM HYPERTROPHIC PYLORIC STENOSIS.

There is no internal disease which can be diagnosed with greater accuracy from the history and by the use only of observation and palpation than the pyloric stenosis of infancy. If a child begins to vomit forcibly, is constipated, and wastes in the first few weeks of life the condition should be suspected; and if the typical gastric peristalsis is seen and the hypertrophied pylorus is felt the diagnosis becomes certain. As in all diseases, the matter of prime importance is to make the diagnosis as quickly as possible, and then the emergency rests in persuading the mother to continue to breast-feed the child or to restore it to the breast if it has already been weaned. Whatever argument may arise about the ultimate details of treatment, it is certain that the most important point is that the child shall continue to be breast-fed. The mortality in breast-fed cases should be less than 10 per cent. In artificially-fed cases it approaches 50 per cent.

From a study of modern tendencies it is safe to predict that shortly the surgical treatment devised by Rammstedt will be universally used. And it may be hoped that we shall reach such a degree of accuracy and proficiency in diagnosis and treatment that the mortality rate will fall below 5 per cent., whereas at present considering all the possible cases throughout the country diagnosed and undiagnosed, the mortality is probably about 50 per cent. When this is achieved the credit will rest more with the practitioner who makes the

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early diagnosis and insists on the breast-feeding than with the surgeon who splits the pylorus.

I have purposely refrained from discussing other necessary steps in the treatment such as the use of gastric lavage, the preparation for operation, the choice of anæsthetic, the post-operative feeding, and the avoidance of pyuria and other secondary infections. These are important, but can be dealt with at leisure, and at all times they will remain quite secondary to the primary and urgent problems of early diagnosis and the continuation of breast-feeding.

DIARRHŒA AND DEHYDRATION.

The effects of an attack of severe diarrhœa in an adult are vastly different from those in an infant. A man may have acute infectious enteritis for a week or two and still maintain sufficient strength and consciousness to go about. Indeed, of such was the garrison of Gallipoli, thin tenesmic creatures crawling to their trenches to pass a dozen stools a day and yet with a bitter jest on their tongues and a wanton smile on their lips. Observe the same condition in an infant, and you see it become limp and hollow-eyed in a few hours. Within a day or two it is too weak to do more than sip or swallow slowly and utter faint plaintive cries. A little later it becomes semi-comatose, with eyes fixed in a distant stare. From this state it may stir on the day before its death to a condition of wakeful restlessness and misery on which sedatives have no effect. Convulsions and collapse symptoms may occur at any time to close the scene. The older designation, "cholera infantum," has given way to the newer "dehydration" or "anhydræmic intoxication," but all are meant to describe the same thing.

The original causes of the diarrhœa are numerous. Some are direct bowel infections. A few from dysentery, typhoid or paratyphoid; but the majority from

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an organism as yet unknown. In others the diarrhoea and dehydration are the terminal result of dyspepsia or of some acute parenteral infection such as septicaemia or pyelitis. But the great danger and emergency arises not so much from the original infection as from the state of dehydration which the diarrhoea causes.

The nature and results of this dehydration have been closely studied in recent years. Both water and essential mineral matter are lost from the blood and tissue fluids. The blood is diminished in volume and concentrated. The blood flow and circulation are deficient. The heart's action is weak. Excessive acids are produced in the tissues as a result of diminished oxidation, and acidosis results.

It is necessary that very active steps should be taken to prevent or treat these symptoms. Whenever an infant has an infection with diarrhoea, it should be seen to that it will receive not less but more fluid than before its illness. Under such circumstances it often happens that instructions are given that albumin water should replace the milk feeds without insisting on the amount to be offered, and it may be found that where the child has been having 20 ounces of milk feed it now receives only sips of albumin water which amount to no more than 5 or 10 ounces a day. On this the dehydration becomes worse. In such a case, although it will be necessary to reduce or dilute the milk feeds, the amount of total fluid given during 24 hours should be from 40 to 60 ounces. For this, Ringer's solution, half strength normal saline or even water may be offered. But it is better still to give Vichy or Contréxéville water, for by drinking these some of the depleted stores of mineral matter will be replaced.

When the dehydration is already extreme, still more active measures are necessary to restore the water balance. For this, subcutaneous and intraperitoneal injections of a sterile Ringer's or saline solution should

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be used, and it is of advantage to add some glucose to this.

There are other subsidiary means of treatment—warmth, intestinal antiseptics, bismuth, and so forth. But a few teaspoonful doses of medicine will never prevent a case of cholera infantum from dying. It is a real medical emergency, and for its cure quarts of Vichy water are better than drops of brandy.

THE BIRTH OF AN INFANT IN A TUBERCULOUS HOUSEHOLD.

This event may at first sight appear to be lacking in those dramatic elements which constitute a medical emergency. The child is born, looks healthy, thrives well for some months, and the possibility of any calamity seems very remote. But it is common experience, which is not disproved by statistics, that many of these infants are doomed unless care is taken to protect them from the infective person in the household. They develop tuberculosis. In the form which the disease takes in a young infant it may be difficult to diagnose, since it may show itself as "marasmus," "dyspepsia," "chronic bronchitis," "pneumonia"; or it may not be revealed until a terminal tuberculous meningitis occurs. Nevertheless, it can be taken as a guiding rule that the younger the infant when exposed to infection the greater the danger. The oft-quoted case of the tuberculous midwife (Runge) serves as an example. She made it a habit of trying to resuscitate children by aspirating the mucus with her own mouth. In the course of thirteen months ten of these children died from tuberculous meningitis, whereas in the practice of other midwives in the same place not a single child contracted the disease.

The infective person is often not a parent. It may be a maid, nurse or a regular visitor. Recently I have seen a case where everything that money and care

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could do was done to provide clean nurseries, sleeping balconies and milk free from tubercle bacilli. Yet one of the children developed tuberculosis at the age of eight months, whereupon a search revealed active pulmonary tuberculosis in one of the nursemaids.

Indeed, the more that is seen of tuberculosis in young children, the more does one become impressed with the great frequency of direct human infection as its source. Moreover, it is now clear that children of tuberculous parents if removed from the source of infection are not more liable to the disease than other children, but probably more resistant.

This brings us to the consideration of the urgency of advising that if anything is to be done to keep the infant from a known source of infection it should be done immediately after birth. For the great danger is in the first few weeks when there is no resistance against the infection. By the age of two or three years most children have probably developed some resistance, and, generally speaking, resistance increases as age advances, so that a child of three years will withstand an infection which would cause serious disease in an infant of three weeks. As a practical measure, whenever a child is born into a household wherein someone is known to have or likely to have tubercle bacilli in their sputum, a clear explanation should be given of the risks that are run and of the means of avoiding them.

Diet in Infective Arthritis.

By VINCENT COATES, M.C., M.A., M.D., M.R.C.P.
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WITHIN recent date a certain amount has been written concerning diet in chronic rheumatic disorders, particularly perhaps in the lay Press, which has made a point of expressing the opinion that the knowledge of dietetics in the medical profession is conspicuous by its absence. Since it appears that opposing views are held concerning diet in these conditions and that teaching is somewhat scanty, I propose within the limits of this article in *THE PRACTITIONER* to discuss diet in that group of subacute and chronic arthritides of the rheumatoid order commonly labelled multiple infective arthritis.

The three main questions usually asked by intelligent patients in regard to their diet amount to: Can I eat meat? Is a starchy diet bad for me? Should I take fat? While general principles would seem to indicate a generous mixed diet in thin and debilitated subjects of arthritis and a more limited diet particularly of carbohydrates in the obese, yet too much generalization is dangerous since the much-vaunted use of cod-liver oil in the atrophic type of arthritis is frequently not tolerated, while in the more bulky type of individual a serious attempt at reduction of weight by a limited carbohydrate diet and a correspondingly enlarged protein intake may result in a dangerous retention of urea in the blood.

Consideration of the facts that infective arthritis runs a prolonged course with exacerbations from time to time, and that at one end of the scale it may exhibit

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itself in almost every joint with gross and crippling changes and with metabolism grossly deviated from the normal, while at the other end it may be limited to a joint or two with little or no metabolic upset, precludes the possibility of a standard diet for such a protean disorder and it is small wonder that there is little if any dogma on the subject.

In deciding what diet to adopt for any one case at any one time, apart from the obvious necessity to increase or decrease weight, *the state of digestion is the main consideration.* It goes without saying that the condition of the teeth both in the matter of sepsis and grinding ability should be the first consideration. In the grosser forms of infective arthritis a fractional test meal may be called for as is usual in the atrophic form achlorhydria, and without the addition of hydrochloric acid a properly plotted diet may be impracticable. The stools should be inspected for gross abnormalities, as, for example, the casts of mucous colitis, a not unusual combination with infective arthritis, since in this condition the intake of fat may have to be limited. A daily evacuation does not necessarily imply normal combustion of the three principal ingredients of food, and a skilled biochemical and bacteriological examination of the urine and stools not infrequently reveals an altered pH. value, indican, increased oxalates and urobilin in the former, and in the latter, patchy protein digestion, increase of volatile substances, deficient pigment and altered fat percentages with excess of streptococci. Such findings go to prove liver inadequacy, which calls for rest of the stressed hepatic mechanism to obviate further dislocation. This is most easily accomplished by cutting down protein and fat and allowing easily assimilated carbohydrates. The efficiency of the carbohydrate mechanism can be arrived at by the glucose tolerance test, and diet adjusted accordingly with, if necessary, insulin

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hypodermically and glucose by the mouth, a method which has been found to result in increase in weight and well-being in emaciated arthritics.

The diet of the obese subject of infective arthritis usually calls for a reduction of carbohydrates, since it is usually the carbohydrates which are not combusted into energy. If there is any doubt of this a basal metabolic rate estimation should be undertaken and the respiratory quotient noted. The diet prescribed in this instance will therefore be rather along the lines of that given to a mild diabetic. If much protein is being taken it may become necessary to examine the urea content of the blood and too much fat must be guarded against to avoid catarrh of the biliary apparatus.

CONCLUSIONS.

There is no standard diet for chronic infective arthritis. At different stages of the disease different diets may be called for.

Generous protein is allowed and even advisable provided the protein metabolism and renal efficiency are intact as evidenced by biochemical examination.

Carbohydrate intake may be normal or even increased in emaciated subjects when given with insulin, but should be reduced in the obese if the carbohydrate mechanism is at fault as proved by the glucose tolerance or basal metabolic rate tests.

Fat in normal or increased quantities is indicated in the atrophic forms of arthritis unless there is a biliary intolerance, mucous colitis or abnormal content in the stools.

Practical Notes.

The Treatment of Typhoid Fever.

W. B. Wherry, T. J. Le Blanc, L. Foshay and R. Thomas publish their method of preparing a detoxicated vaccine for the treatment of typhoid fever and their results in a series of 28 cases; 68 control cases were under observation at the same time. The authors state that *B. typhosus* antigen can be detoxicated to a considerable degree by treating it with formaldehyde according to Ramon's method, and about 82 to 164 million treated bacilli may be injected subcutaneously, and daily, into a patient with typhoid fever, irrespective of the apparent severity of the disease, without any harm. The 28 cases were treated by daily subcutaneous inoculations. The course of the disease was shortened (as compared with the control cases), the temperature uniformly showing a tendency to drop to normal after the seventh or eighth dose and then coming to normal by irregular lysis. The average duration of the fever was 27.5 days in the treated cases and 39 in the controls. Complications were 7 per cent. in the treated and 36 per cent. in the controls. The death rate was nil in the treated and 10 per cent. in the controls.—(*Journal of Infectious Diseases* [Chicago], September, 1928, p. 189.)

The Treatment of Migraine.

M. Serog presents an analysis of twenty cases of severe migraine in which he has obtained remarkable improvement by the use of intravenous injections of strontium. Three injections of a strontium salt are given, 5 c.cm. on two consecutive days and the third two days after. From the results obtained and the known action of strontium in causing an increase in the tone of blood vessels, Dr. Serog concludes that the basis of the condition migraine lies, not in vascular spasm, but in hypotonic disturbances of the vasomotor system.—(*Medizinische Klinik*, August 17, 1928, p. 1279.)

The Treatment of Chronic Infections of the Prostate and Seminal Vesicles.

C. H. Garvin insists that non-specific prostatitis and vesiculitis are much more common than is generally thought, and the symptoms, clinical findings and treatment vary but little from those due to the gonococcus. Examination of the prostate per rectum, without microscopical examination of the expressed secretion, is inadequate. Treatment should be persisted in until all evidence of infection has been eradicated. Massage, dilatation and instillations form a triad of treatment, which if persisted in will bring about a cure. A standard of cure which does not include a urethroscopical examination, microscopical and cultural examination of the expressed

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secretion of the prostate and seminal vesicles, is incomplete.—
(*Medical Journal and Record* [New York], September 5, 1928, p. 213.)

Freckles and their Treatment.

R. O. Stein, in discussing hyperpigmentation of the skin in its various forms, deals with the nature of freckles and their removal. It is necessary to produce peeling of the skin until the layer is reached in which the pigment is situated, and the following solutions are recommended as they cause some bleaching of the pigment at the same time:—

R.	Sod. biborat.	-	-	-	15.0 g.	(3 iv)
	Pot. carbon.	-	-	-	5.0 g.	(3 ias)
	Aq. colonien.	}	-	-	80.0 g.	(3 iiss)
	Aq. rosar.					

This solution should be applied to the affected areas morning and night. For long-standing cases, a mercury solution may be used:—

R.	Mereur. sublim. corros.	-	1.0 g.	(grs. xv)
	Spir. vin. dilut.	-	100.0 g.	(3 iij)

This should be applied to the freckles with cotton-wool, and the parts so treated should, whenever possible, not be washed with water, as a watery solution of sublimate is much more irritating to the skin than an alcoholic one.—(*Wiener Klinische Wochenschrift*, August 30, 1928, p. 1267.)

Pitfalls in Pyelography.

M. B. Wesson points out that many bizarre-shaped pyelograms reported as pathological are normal. Bilateral pyelograms should always be made unless there is a specific contraindication. Most conditions that contraindicate bilateral pyelography also prohibit all urethral and ureteral manipulations. Any case that will tolerate bilateral collection of urine will not resent bilateral pyelography. Untoward effects attributed to modern pyelography are due to urethral or ureteral irritation with resultant anuria. Gravity pressure with two burettes at a height of 18 in. to 24 in. will produce satisfactory pyelograms with a minimum of discomfort to the patient. Under-injection is just as dangerous as over-injection because of the resultant incorrect diagnosis. Because of the innocuousness of the 12 per cent. sodium iodide used in pyelography, the question of too much pressure by syringes has become a matter of academic interest only, the over-injection merely spoiling the pyelogram and causing the patient temporary discomfort.—(*Journal of Urology*, September, 1928, p. 355.)

Routine Blood-sugar Determination as an Aid to Diagnosis.

C. M. Levin is of opinion that blood-sugar determination as a routine procedure is of great value as an aid to diagnosis and is justifiable as a clinical diagnostic measure. He gives details of five cases, all of which proved to be early cases of diabetes mellitis,

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in which the history and physical examination (including X-ray examination, blood-count and urine analysis) gave no help, until a blood-sugar determination was carried out.—(*New York State Journal of Medicine*, September 1, 1928, p. 1050.)

The Treatment of Asphyxia Neonatorum.

R. A. Wilson recommends, for the treatment of asphyxia neonatorum, the injection of alpha-lobeline into the umbilical vein, the dose being $\frac{1}{16}$ to $\frac{1}{8}$ grain. Until recently lobeline, the principal alkaloid of the plant lobelia, had been isolated only in the form of amorphous salts, which had in a high degree the property of producing emesis, which was considered its chief action. In 1916 Weiland, in Germany, succeeded in preparing a pure crystalline hydrochloric salt, which does not cause vomiting, and it was this salt that Dr. Wilson employed, as it has a favourable action on the circulation. The umbilical vein is easy to identify and enter, but in case of doubt all three umbilical vessels can be injected. The clinical results have been most encouraging, the initial respiration occurring from seven to twenty seconds after injection.—(*American Journal of Obstetrics and Gynecology*, September, 1928, p. 379.)

The Treatment of Thrombo-Angiitis Obliterans.

R. Leibovici insists that in a case of thrombo-angiitis obliterans a surgeon should not operate for a single trophic ulceration, but that gangrene of at least one toe should be present before operative treatment is called for. In the case of gangrene of one toe the surgeon should wait as long as possible for the dividing furrow to form. In patients who can afford to wait a long time it is enough to amputate the gangrenous toe; but in poor patients who cannot wait it is best to amputate the foot right away, employing a heel flap. A high or low amputation depends on the vitality of the leg.—(*Paris Medical*, July 7, 1928, p. 21.)

The Treatment of Sterility in Women.

E. Douay has found the following treatment successful in cases of sterility due to atresia of the cervix uteri, whether congenital or caused by displacement of the uterus or by spasm. Under general anæsthesia the cervix is dilated, and a bilateral incision is made into it. Without curettage, an elastic tube is then passed into the uterus; this tube is of the same type as an in-dwelling catheter, with dilated ends. Vaginal douching is carried out for 48 hours and the tube may be left in place for as long as two months.—(*La Gynécologie*, August, 1928, p. 483.)

The Treatment of Ozæna.

E. Feldstein observes that the etiology of ozæna still remains a mystery, in spite of much research and many enticing theories. It has been well recognized that the paradiphtheritic bacillus is

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encountered with remarkable frequency in the nasal secretions in ozæna, and Dr. Feldstein's bacteriological examinations have confirmed this. The logical consequence of the discovery of the paradiphtheritic bacillus was the employment of Roux's serum in the treatment of ozæna; but the results, though successful, were fleeting. Dr. Feldstein, however, has been employing, with great success, the diphtheria anatoxin of Ramon: intramuscular injections are given twice weekly for two months, beginning with half a c.cm. and increasing to 3 c.cm., diluted with an equal quantity of physiological serum. A second series of injections is often necessary two or three months later. The crusting, the unpleasant odour, and the atrophic pharyngitis soon disappear under the influence of this treatment.—(*Journal des Praticiens*, October 20, 1928, p. 681.)

The Effect of Tonsillectomy on Heart Disease.

W. B. Farnum has studied the effects of tonsillectomy on existing heart disease in adults in 526 cases, who were followed in the clinic for from two weeks to nine years, and has come to some interesting and rather unexpected conclusions. Tonsillectomy, although carried out under as nearly ideal conditions as may be obtained, will initiate an attack of acute rheumatic polyarthritis in a certain number of cases and further an actual spread of endocardial or myocardial infection. Tonsillectomy does not by any means stop the recurrence of sore throat. Such sore throats are often concomitant with acute rheumatic polyarthritis and the evidence of renewed cardiac involvement. Tonsillectomy in this group of cases does not seem to have a very great effect on the recurrence of chorea. Dr. Farnum concludes that in adults with existing heart disease the hope for improvement placed in tonsillectomy has been based on a shaky foundation. If tonsillectomy is to be generally used in the future on a definite therapeutic measure in heart disease, its best result will be obtained before the incidence of heart infection or very early in its course.—(*American Journal of the Medical Sciences*, October, 1928, p. 474.)

The Treatment of Diabetes in Children.

F. Theones states that even in slight cases of diabetes mellitus in children insulin should be employed, but the diet must always be controlled, as the severity of the condition can best be gauged by the reaction of the patient to a normal diet. All precomatose and comatose children should be given large quantities of carbohydrates at the same time as large doses of insulin, and gradually the carbohydrates are replaced with fats and proteins, the doses of insulin being *pari passu* reduced.—(*Monatsschrift für Kinderheilkunde*, May, 1928, p. 507.)

The Treatment of Fractures of the Ankle.

F. D. Dickson makes it a routine in his clinic that all ankle fractures are reduced at the earliest possible moment and fixed

in a plaster cast. Reduction is made under full anæsthesia, the ankle being grasped in one hand and pressure made outwards in the region of the internal malleolus. The foot is grasped with the other hand well back towards the heel, the thumb resting just below the external malleolus, and the fingers grasping the inner side of the heel. With the hands in this position the foot is inverted and pushed sharply inwards. Only a moderate degree of inversion is necessary, but no harm has ever come from too much inversion. When backward or forward displacement of the foot is present, this must be corrected by appropriate manipulation. The essential feature of the reduction is a restoration of the ankle mortise. Failure to achieve this results in a faulty weight-bearing surface at the ankle-joint, and a painful and impaired extremity which can be improved only by later operative interference. Check radiograms should be taken after reduction and, if deemed necessary, at intervals afterwards.—(*Journal of the American Medical Association*, September 22, 1928, p. 845.)

Non-Greasy Medicaments for the Skin.

A. Strauss describes various solid preparations for the treatment of skin lesions which have the advantage of being non-greasy, as opposed to ointments, and which do not therefore require any dressings or bandages to be placed over them to prevent them staining the clothing. The cost of the necessary treatment is also greatly diminished. The basic formula of all the preparations is as follows:

Paraffin liq.	-	-	- g. 4.0 (3 i)
Glycerin	-	-	- g. 8.0 (3 ij)
Traganth	-	-	- g. 2.0-3.0 (grs. xxx-xlv)
Zinc. oxyd.	}	-	- ana ad g. 100.0 (3 iij)
Amyli			
Aq. dest.			

The amount of starch and zinc oxide can be varied according to requirements.

To this basis any suitable medicament, such as ichthyol, sulphur, resorcin, etc., can be added. It forms a smooth, rapidly drying, non-irritant covering for the skin which is hardly noticeable.—(*Medizinische Klinik*, September 28, 1928, p. 1512.)

The Diagnosis of Syphilis of the Bladder.

M. Chocholka suggests that syphilis of the bladder is much commoner than is often imagined, and he has himself diagnosed 56 cases in the past twelve years. The diagnosis is based more on the prompt reaction of the syphilitic lesions to antisyphilitic treatment than on cystoscopic examination or the Wassermann reaction. There are two characteristic forms of the condition: one in which the mucous membrane of the bladder is of a waxy yellow colour, with small nodules of the same colour and bluish blood-vessels; and the other in which the lining mucous membrane presents small islands of mulberry-like granulations.—(*Journal d'Urologie Médicale et Chirurgicale*, June, 1928, p. 513.)

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The Treatment of Hypertrophy of the Prostate with X-Rays.

J. Fürstenau records the results obtained in 59 cases of hypertrophy of the prostate which were treated with X-ray exposures. Most of these cases were unsuitable for operative treatment owing to their bad general condition, incident upon intercurrent diseases such as arterio-sclerosis, diabetes, cardiac failure or bronchitis. The exposures were given in series of two to three days at intervals of four weeks, each exposure lasting six minutes. Almost all the cases—93 per cent.—were completely freed from pain after a course of this treatment, and in the vast majority micturition became less frequent and entirely painless. Dr. Fürstenau compares these results with those of perineal and supra-pubic prostatectomy, and considers that this conservative treatment by X-ray therapy to be the most suitable method of treatment in any case of hypertrophied prostate in which the general health of the patient is at all questionable.—(*Deutsche Medizinische Wochenschrift*, September 28, 1928, p. 1624.)

The Treatment of Vomiting in Children.

F. Hamburger, in dealing with the numerous conditions which give rise to severe vomiting in children, describes the treatment he has successfully employed in the chronic vomiting associated with catarrhal conditions of the stomach in the neurotic type of school child. He gives the following mixture in five-drop doses three times a day before meals :

R	Tinct. gent.	-	-	-	-	g. 2.0 (m. xxx)
	Tinct. nuc. vom.	-	-	-	-	g. 3.0 (m. xlv)
	Tinct. chin.	-	-	-	-	g. 15.0 (̄iv)

With this he gives atropine sulphate in doses of g. 0.001 (grs. $\frac{1}{100}$) as this tends to lessen the irritability of the gastric mucous membrane. An easily assimilated diet must be given at the same time. It is sometimes advisable to give the atropine by subcutaneous injection if it is not well tolerated by the mouth. For the distressing vomiting which accompanies whooping cough, Dr. Hamburger has found papaverine, g. 0.3 to 1.0 : 150, one teaspoonful three times a day, of great help.—(*Münchener Medizinische Wochenschrift*, September 14, 1928, p. 1605.)

The Treatment of Hæmorrhage from Gastric Ulcer.

X. Delore and J. de Girardier insist that hæmorrhage from gastric ulcer is best treated by surgical operation; but the time of operation must be neither immediately after the hæmorrhage nor too late. Medical treatment should be given after the hæmorrhage until the patient's condition has improved enough for operation.—(*La Presse Médicale*, August 29, 1928, p. 1,092.)

Reviews of Books.

Ultra-Violet Radiation and Actinotherapy. By ELEANOR H. RUSSELL, M.D., B.S., and W. KERR RUSSELL, M.D., B.S., with forewords by Sir Oliver Lodge, F.R.S., D.Sc., LL.D., and SIDNEY WALTON, C.B.E., M.A., B.Litt. Third edition. Pp. 648, plates 259. Edinburgh: E. & S. Livingstone. 21s. net.

THE appearance of the third edition of this book is evidence of its value in the past to practitioners and students of actinotherapy. Those who are taking up the study of this branch of treatment in earnest will find this new edition to be even more helpful and instructive, while those already familiar with the application of artificial sunlight will find many useful hints and new and valuable ideas. In a well-written introduction the optimistic claims of actinotherapists are defended, while the danger of the administration of the rays by the unqualified is emphasized, and recommendations are made to obviate this risk. The opening chapters deal with the history and the nature of radiant energy and natural sunlight therapy. Carbon, tungsten and iron lamps are described in detail and there is a chapter on quartz mercury lamps. The chapters dealing with the chemical, physical and biological properties of the rays will be of great interest to those who require more than a superficial knowledge of the subject. The chapter on technique is practical, as is the detailed description of treatments together with the authors' results in different diseases. The book is well illustrated and the bibliography and index are complete. A vast amount of knowledge is compressed in a comparatively small space, and yet style and clarity have not been sacrificed. The treatment of the subject is most exhaustive, necessitating an increase of two hundred pages on the last edition. The work is obviously intended for those who require a deeper knowledge than is given by the ordinary book on the subject, and it is doubtful whether a better book of this scope has been written.

Pocket Medical Dictionary. By GEORGE M. GOULD, A.M., M.D., etc. Ninth Edition. London: H. K. Lewis & Co., Ltd. 10s. net.

WE are pleased to welcome the appearance of the ninth edition of Dr. Gould's pocket medical dictionary. The book is conveniently small and eminently suitable for carrying about. It is very concise, although including over 40,000 words of up-to-date medical value, each of which is explained shortly, yet satisfactorily and to the point. In addition, there are some useful tables which should prove invaluable to the busy man in practice. The price is moderate, and this edition should be very popular.

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